DEC 20 1921

The Medical Lib.

British Medical Journal

The Journal of the British Medical Association.

INCLUDING AN EPITOME OF CURRENT MEDICAL LITERATURE.

WITH SUPPLEMENT.

No. 3179. SATURDAY, DECEMBER 3, 1921. **Price 1/3**

The Practitioner.

SEE PAGE 30.

NOW READY. 36s. net. Postage 1s. 3d.

THE

MEDICAL DIRECTORY 1922.

Buy now and secure a whole year's use.

J. & A. CHURCHILL, 7, Great Marlborough St., W.1.

(*See also page 3*).

By BEDFORD FENWICK, M.D.,

Consulting Gynæcologist to The Hospital for Women, Soho Square.

UTERINE FIBROIDS AND OTHER PELVIC TUMOURS.

THIRD EDITION. With Tables and Analyses of 1,000 gynæcological laparotomies.

"Dr. Fenwick's results are remarkably good."—THE LANCET.

Price **10s. 6d. net.**

BALE, SONS & DANIELSSON, LTD., 85, Great Titchfield Street, W.

HYPNOTISM AND TREATMENT BY SUGGESTION. 3rd Ed.] **[5/- net.**

By ALBERT E. DAVIS, F.R.C.S.Ed., L.R.C.P., Hon. Phys. to the Liverpool Psycho-Therapeutic Clinic. SIMPKIN MARSHALL, & Co., Ltd.: London.

PULMONARY TUBERCULOSIS

ITS ETIOLOGY AND TREATMENT.

By DAVID C. MUTHU, M.D., Chief Physician, Mendip Hills Sanatorium. [READY SHORTLY.

BAILLIÈRE, TINDALL & COX, 8, Henrietta St. W.C.

WORKS BY FRANK KIDD, M.B., B.C.(Cantab.), F.R.C.S.(Eng).

COMMON INFECTIONS OF THE KIDNEYS.

With the COLON BACILLUS and ALLIED BACTERIA.

Demy 8vo. Cloth 336 pp. Illustrated in colour and black and white. Price 18/- net.

HENRY FROWDE & HODDER & STOUGHTON, 1 & 2, Bedford Street, London, W.C. 2.

URINARY SURGERY.

A REVIEW.

Demy 8vo. Cloth. 448 pages. 7/6 net.

COMMON DISEASES OF THE MALE URETHRA.

Being a Course of Lectures delivered at the London Hospital.

Demy 8vo. Cloth. 148 pages. 6/- net.

LONGMANS, GREEN & Co., 39, Paternoster Row, London, E.C.4.

SECOND EDITION. 20s. net.

BY

HERBERT J. PATERSON,

C.B.E.; M.C., M.B. (Cantab.), F.R.C.S.

THE

SURGERY OF THE STOMACH.

A Hand-book of Diagnosis and Treatment.

"A masterpiece among monographs."—*The Practitioner.*

JAMES NISBET & Co., London, W.

OXFORD MEDICAL PUBLICATIONS

JUST PUBLISHED.

HEART DISEASE AND PREGNANCY

By SIR JAMES MACKENZIE, M.D., F.R.C.P., LL.D., (Edin. and Aberd.) F.R.S., F.R.C.P.I., Hon.

Consulting Physician to His Majesty The King in Scotland; Director of the Institute for Clinical Research, St. Andrews; Consulting Physician to the Victoria Hospital, Burnley, and the London Hospital.

Demy 8vo. Cloth. Illustrated. Price 8s. 6d. net.

HENRY FROWDE AND HODDER & STOUGHTON, THE LANCET Building, 1 & 2, Bedford Street, London, W.C. 2.

Angina Pectoris.

A CURABLE GASTRIC REFLEX DISORDER.

By Walter Verdon, F.R.C.S.

Right Hon. Sir CLIFFORD ALLBUTT, K.C.B.—"*I see much of great interest in your.....work.*"

Sir JAMES MACKENZIE, F.R.S.—"*A storehouse of facts and observations of the greatest value. . . . A classic.*"

MED. TIMES.—"*Wealth of practical detail.*"

BAILLIÈRE, TINDALL & COX. Pp. 414. 18s. 6d.

THIRD EDITION, Enlarged. Price 11/6.

CLINICAL METHODS IN TROPICAL MEDICINE.

By G. T. BIRDWOOD, M.A., M.D.Cantab., D.P.H., *Late Principal, Agra Medical School,*

AND FIVE OTHER CONTRIBUTORS.

A Guide for Practitioners in the Tropics in Diagnosis and Therapeutic Measures.

"New chapters on the recent treatment of leprosy, the management of hookworm disease, the identification of poisonous snakes. Certainly a volume which every student of tropical medicine should possess."—*British Medical Journal.*

THACKER & Co., 2, Creed Lane.

SECOND EDITION. In Two Vols. 45/- net.

DEFORMITIES

INCLUDING

DISEASES OF THE BONES AND JOINTS.

A TEXT-BOOK OF ORTHOPÆDIC SURGERY

By A. H. TUBBY, C.B., C.M.G., M.S.

Illustrated by 70 Plates and over 1,000 Figures, all by Notes of Cases.

2ND EDITION.—"The standard text-book in English on the subject."—*The Lancet.*

1ST EDITION.—"Standard work on the subject in the English language."—*Brit. Med. Jour.*

MACMILLAN & Co., LTD., St. Martin's Street, London, W.C.

By W. SOLTAU FENWICK. M.D.

CANCER OF THE STOMACH.

392 pages. 10s. 6d.

ULCER OF THE STOMACH AND DUODENUM.

392 pages. 10s. 6d.

J. & A. CHURCHILL, 7, Great Marlborough St., W. 1

DYSPEPSIA

Its Varieties and Treatment.

SCHALL & SON

BRITISH PROPRIETARY (W. E. SCHALL, B.Sc. Lond., F.Inst.P.) BRITISH CAPITAL

ESTABLISHED 1887

The oldest established firm devoted solely to Electro-medical and X-ray Apparatus.

THE

Pantostat

(EARTH FREE)

UNIVERSAL APPARATUS

FOR

Cautery, Light, Galvanism, Sinusoidal Faradism, Power, and (in conjunction with Diathermy Apparatus) Cold Cautery Work.

CYSTOSCOPES

FROM STOCK.

All types of Electro-medical and X-ray Apparatus are manufactured throughout in our Works on the Premises:

71/75, NEW CAVENDISH STREET, LONDON, W. 1.

A New Edition of our X-ray Catalogue ("X-ray Apparatus and their Management") is just ready—post free on request.

BELGIAN AGENCY—Maison Wissaert, 9, Rue de l'Hopital, Brussels.

The MACKENZIE-LEWIS POLYGRAPH

An improved form of MACKENZIE POLYGRAPH designed by Sir T. LEWIS.

Among its advantages are :—

(1) Lag and distortion of wave form are minimised by the construction of the tambours and receiving chambers.

(2) The glycerine pelotte is used as the receiving chamber.

(3) The paper passes in a direction which assists the ink to flow.

(4) The instrument in its case is complete, ready for use, no connecting or disconnecting required.

Dimensions: 9" × 5¼" × 5"
Weight: 4½ lbs.

Write for List No. B 181.

The Cambridge and Paul INSTRUMENT Co Ltd

WORKS: LONDON & CAMBRIDGE — *Head Office & Showrooms* 45 GROSVENOR PLACE, LONDON, S.W.1.

A Lecture
ON
VARICOCELE IN THE FEMALE.

GIVEN TO GRADUATES AT ST. MARY'S HOSPITAL, MANCHESTER, NOVEMBER, 1921.

BY

PROFESSOR W. E. FOTHERGILL,

HONORARY SURGEON TO ST. MARY'S HOSPITAL; HONORARY GYNAECOLOGICAL SURGEON, MANCHESTER ROYAL INFIRMARY.

A RECENT writer remarks that perhaps no subject in the field of gynaecology has been so thoroughly neglected as varicose veins in the female pelvis. He rightly says that there are but a few important clinical reports on the topic in the literature, and he mentions those by Winkel in 1886, by Dudley in 1889, by Miller and Kanavel in 1905, also Skene's textbook written in 1895. As these communications are not easily available for reference I may mention that I referred to the subject in my *Handbook of Diseases of Women*, published in 1910, and gave a clinical lecture on it which appeared in the *Clinical Journal* on March 31st, 1915. Further, a paper by J. A. Wall was printed in *Surgery, Gynecology, and Obstetrics* in 1916 (vol. ii, p. 61). The recent writer I have quoted is L. A. Emge, whose paper is in *Surgery, Gynecology, and Obstetrics* for February, 1921. As it would seem that the subject is not yet stale I propose to bring it more or less up to date in this lecture.

Anatomy.

Anatomists describe five plexuses of veins in the pelvis: The vaginal, the uterine, the vesical, and the haemorrhoidal, which drain into the inferior hypogastric vein, and, last but not least, the pampiniform plexus. This drains into the ovarian vein; and it must be noted that the right ovarian vein opens direct into the vena cava, its entrance being guarded by a valve which is said to be the only one in the pelvic venous system. The left ovarian opens into the left renal vein, with nothing to prevent venous backward pressure.

The vaginal, uterine, vesical, and haemorrhoidal plexuses of veins are all embedded in the subperitoneal pelvic tissue, which, besides connective tissue of varying density, contains plenty of non-striped muscular tissue. Thus these veins are well sheathed and supported. But the pampiniform plexus is made up of two masses of veins, one above and one below the ovary, and these lie simply between two layers of peritoneum without any other support. The ovarian vein itself is merely covered by peritoneum and is not embedded in connective or muscular tissue.

It follows from these considerations that the veins in the broad ligaments, and especially those of the left side, are, of all venous structures in the female body, the most liable to distension. Bunches of varicose veins in the broad ligaments are, indeed, a familiar sight to all who are in the habit of exploring the pelvis, even in the Trendelenburg position, through abdominal incisions.

Etiology.

It must be made perfectly clear that varicose veins in the pelvis are often seen in connexion with fibroids and other new growths, in cases of old pelvic infection and also in cases of marked retroversion. These secondary venous distensions do not concern us at present. They have nothing to do with the case, and are managed by treating surgically the primary conditions to which they are secondary.

The varicosities in question are not secondary to any other pelvic lesion, and their causation is just the same as that of varicose veins in the legs and in the vulva. Like other varicose veins, those in the broad ligaments are made worse by pregnancy and by occupations that keep the patient standing during long hours. They are common in teachers, shop assistants, and post-office officials.

Pathology.

Congestion and oedema of the ovaries are constantly observed in these cases, and numerous small cysts are often seen after prolonged venous congestion. Overgrowth of fibrous tissue follows if the congestion is excessive. In some cases the internal secretion of the ovary would seem to be increased, at least for a time, for menorrhagia is a common symptom. But in other cases there is relative amenorrhoea, which suggests sclerosis of the ovaries and atrophy of their essential tissue.

Emge says that

> "with progressive distension the units of the pampiniform plexus are gradually affected until ultimately the uterine and other plexuses of the pelvis are involved also by virtue of their intimate relation through the anastomatic uterine vein."

No doubt this may be the course of events in some cases. But we see cases of extreme varicosity in the vulva or vagina, in the bladder, in the uterine sinuses, and also in the rectum, which is not extension of varicosity of the pampiniform plexus.

Symptoms and Course.

The leading symptom is dull aching pain in the left side low down; it is often felt on both sides, and sometimes is confined to the right side. Young girls do not complain of this pain, but its onset is often preceded by a few years of congestive dysmenorrhoea. The pre-menstrual and menstrual aching prolongs itself into the intermenstrual period, until the gnawing pain is practically continuous except when the patient is lying down. The condition may begin to be troublesome after marriage or after parturition, and is seldom relieved by either event. It is usual to say that the pain is made worse by constipation, and this is true in the sense that curing constipation relieves pelvic congestion. But there are some women in whom a loaded rectum is habitual, and seems to support the varicocele in some degree, for they state that they are more free from pain when the rectum is comfortably full than when it has been emptied. The natural cure of the condition comes, in many cases, with the menopause, for there is then a marked reduction of the pelvic blood supply, often accompanied with the deposition of much fat, which may support the veins in some degree.

It will be said that many men have varicocele without pain, and that many varicose veins in the legs do not ache. No doubt, also, there are innumerable women with varicocele in the broad ligaments which does not enter consciousness in the form of pain. The sensitiveness of the nervous system plays its part. The hyperaesthetic woman will feel as severe aching a degree of venous distension which the ordinary woman would only describe as a feeling of weight in the pelvis or a bearing down, and the stolid woman would not feel it at all. This is borne out by the fact that the pain often vanishes when a woman is in good health, only to return whenever she becomes run down, as, for example, after an attack of influenza.

Diagnosis.

The condition is suspected as soon as the patient has described her symptoms and given her history. But the diagnosis is only made after excluding the conditions—new growths, retroversion, and the results of infection—which can produce secondary varicocele or can complicate the primary form. If bimanual examination shows the pelvic organs to be normal in size, shape, consistency, and position, the leading symptom is sufficient to establish the diagnosis if there is no history of venereal or septic pelvic infection. I have previously written that the bunches of veins cannot be felt by the examiner; but Emge says that this is because the patient is examined in the recumbent posture, and in this position the veins are well drained and not palpable. He states that if, during examination by the recto-vaginal touch, the patient is asked to drop her legs and assume a sitting posture, it is often as easy to feel these veins in the female as in the male. As they fill up they form "an easily compressible and doughy tumour that is much less tender than either an inflamed or an ectopic tube." The tumour will disappear when the patient lies down again. This is quite correct. The presence of varicose veins in the legs of a patient gives a useful hint.

The condition of varicocele in the female is generally diagnosed as ovaritis. A student who mistook varicocele in the male for orchitis would rightly be referred for a period of further study, and he should suffer the same punishment for making the same mistake in the female patient. When the pain is confined to the right side it is possible to mistake the condition for appendicitis, and both

may, of course, be present in the same case. When there is doubt, examination in the sitting or standing posture should clear up the point.

Prognosis.

Many women with constant pain in the sides have healthy children one after another and have good health in other respects. The pain generally disappears at the change of life, but until that in reached there is no prospect of permanent relief in pronounced cases. The slighter cases are amenable to treatment in some degree. The important factor is the patient's nervous system. The hyperaesthetic woman, especially if she has a kind husband and sympathetic relatives, is likely to transfer her patronage from one doctor to another until, after descending a scale of faith-healers and quacks, she ends up a hopeless neurasthenic, bereft of her appendix and both her ovaries. The ordinary patient, after having her discomfort explained by a wise medical adviser, will adjust her life according to his instructions, take care of her general health, keep her bowels loose, and put up with the aching when she cannot avoid it.

Treatment.

A careful and sound prognosis is the essential element in the treatment of this condition.

Unfortunately the diagnosis of ovaritis has often led to mistaken treatment of varicocele. For the word ending in "itis" suggests inflammation. The idea of inflammation suggests the use of hot douches and glycerin plugs, which make the patient much worse. Who would blister the scrotum for varicocele and who would remove the testis? Yet square yards of blisters have been used and multitudes of ovaries have been excised for the same condition in women.

Bunches of dilated veins in the broad ligaments have often been tied and excised with temporary benefit; but the pain generally returns sooner or later, with disappointment as the result. It must be allowed that there is at present no local or surgical treatment available. The patient should be told to keep her bowels loose and to avoid standing, but to take plenty of active exercise—work or play. The most useful drugs in my experience are the two old-fashioned mixtures—cascara, belladonna, and strychnine; and quinine, iron, and Epsom salts. Many patients find peace by taking a small saline aperient every morning. A change of employment often works like a charm.

ON FORECASTING.

A CONTRIBUTION TO THE PROGNOSTICS OF SOME ANOMALIES OF THE HEART AND OF THE URINE.

BY

W. P. S. BRANSON, C.B.E., M.D., F.R.C.P.,

PHYSICIAN, ROYAL FREE HOSPITAL; MEDICAL OFFICER, SUN LIFE ASSURANCE SOCIETY.

FORECASTING is a treacherous business, especially when chronic affections are at issue. But we cannot escape it; for a patient's interest in the remoter future of his health is only second to his interest in being cured outright, and, when a cure appears to be unattainable, the problem of the future fills his field of vision.

Moreover, forecasting is potent for good or for evil, according as it is judicious or the reverse. Well men have been made sick men by ill-judged interpretations of unimportant anomalies, and sick men have been made much better by well-chosen yet honest prophecies; for "there are ways and ways," as the saying goes, of breaking bad news. I have heard it said of a well-known physician, no longer living, that a patient, consulting him for, say, Bright's disease, would leave with the conviction that Bright's disease was reserved only for the luckiest among men. Surely the height of compliment—or so it seems to me.

I will assume, then, that the first essential of a judicious prognosis is a correct interpretation of abnormal findings.

The second is, that the observer should have access in his mental library to a good supply of apposite life-histories on which to base his forecast. But these are hard to come by. We are taught certain standards of physical health, standard interpretations of physical abnormality, and standard forecasts of disease, and spend the rest of our lives amending them in the school of experience. In this slow school we learn, among other things, two lessons which are vital to breadth of view. The first concerns the number and extent of the departures from standard normality which are compatible with health. The second is that standard prognosis is but the vaguest generalization, and necessarily leaves out of account the one factor which more than all else determines the event—namely, the response of the individual to the disease he carries. This factor is itself one of the utmost variability, moulded as it is by a hundred subtle influences—heredity, temperament, success or failure, labour or ease, sobriety in living or its reverse, and who shall say what other accidents of change and chance? So we need not wonder that standard prognosis of chronic affections helps us little, nor that forecasting should be, in practice, so difficult as it is.

The third essential to judicious forecasting is optimism—strained to the furthest limits of honesty, except in the case of the patient whose native hopefulness is such that nothing short of a good fright will make him take the precautions necessary for his safeguarding. Fortunately, if I may judge by my own evolution in this matter, experience makes for optimism, on the whole. Perhaps in one's early days one's view is coloured by recent memories of many autopsies, in which were revealed the fatal end-results of diseases, but not the conditions of life and the long intervals of time which had been required to develop them to their lethal pitch. Certainly I am more sanguine now than I used to be.

I have said that apposite life-histories upon which to base a reasoned forecast are hard to come by. It is only the old in years and experience who have had the opportunity to collect at first hand an abundance of facts on this important subject. Even at second hand precise data are not very accessible, though a wealth of them must be reposing in the memories of the fathers of our craft throughout the country. So I have been tempted to record in this essay a few facts which have a bearing on the prognosis of some abnormalities of the heart and of the urine, together with some tentative opinions.

Most of the facts are drawn from experience gained during the last sixteen years at the headquarters of a large life assurance society. It is a form of experience which gives a good insight into "the normal," for a very large majority of the people who submit themselves for examination believe themselves to be well. At all events they are active and busy members of society, and represent the average of the workaday non-invalid community. Moreover, owing to the fact that the same individual is occasionally re-examined at intervals of years for fresh assurances, one is able sometimes to date approximately the emergence of disease and to mark its progress and duration. Lastly, the examiner in this sphere of medicine has the advantage of an instructive custom somewhat favoured by the rejected of insurance offices, or such of them as prefer not to die punctually of their disabilities. Their custom is to revisit the scene of their sentence years after its delivery, and to flaunt their continued well-being before their judge or his successor. This practice, however doubtful in taste, serves a very useful purpose in correcting preconceptions.

For a good many of the facts that follow I am indebted to Dr. W. E. Risdon, until lately my senior colleague at the Sun Life Assurance Society, who has been good enough to put at my disposal instances drawn from an experience probably unique in its extent. To him, and to the directors of the society for permission to make use of records, I wish to express my acknowledgements.

ABNORMALITIES OF THE HEART.

1. *Of the Impulse.*

All things considered, the position of the heart's impulse is wonderfully constant in adult life. If it is in the fourth space it tends to be in the nipple line, but if, being in the fifth or sixth space, it is displaced outwards even a little, one is entitled to be suspicious. Yet occasionally a slight outward displacement in these spaces seems to be no more than a physical idiosyncrasy. I have met it a good many times in circumstances which offered no explanation of it. For instance—a man, aged 35, had an impulse in the nipple line in the sixth space; no increased

force, no murmur, no albumin. He had previously been charged an extra rate by another office on account of his heart. He was re-examined on four occasions within the next eleven years, and at the age of 46 was in good health and physically unaltered. On the other hand, I believe that a nipple-line impulse when combined with any increase of force must be regarded as pathological, whether it be in the fifth space or the sixth. It is a singular thing that most athletes, even those who have indulged largely in the most taxing sports, such as rowing, do not exhibit any palpable increase in the force of the heart's impulse. A sixth-space impulse within the nipple line is not infrequent in them, but its force is average. I am driven to conclude that in the healthiest hearts the increased efficiency demanded by violent exercise is met by a physiological reserve which spares the necessity for gross hypertrophy; and that when in such people hypertrophy does occur to a palpable extent, it is evidence that the heart has overdrawn its balance. If this be a correct inference, then the so-called "athlete's heart" is a heart which has proved unequal to the strain put upon it.

2. *Abnormalities of Rate.*

(*a*) *Hurry.*—All grades of hurry are met with, some being so extreme as to make examination of the heart sounds impossible. Minor degrees of hurry are of no account, being merely an expression of the mild panic into which the prospect of a medical examination throws plenty of healthy people. But it is otherwise with the extreme grades. At least, there is some evidence that hearts which habitually race on small excuse may do damage both to themselves and to the vascular system in course of time. For example:

A man, examined for the first time at the age of 24, was noted as having "very neurotic heart sounds," but no murmur nor albumin. Five years later, when he was 29, the heart's impulse was "a little too forcible and extensive." There was still no albuminuria. Eighteen years after the first examination, when he was 42, the impulse was in the nipple line and increased in force, and there was albuminuria.

In this connexion I may mention the case of a woman who said that she began to suffer from palpitation of the heart at the age of 18. This lasted for some seven years and then ceased. Eleven years later, in her thirty-sixth year, it recurred. At 38 she developed an enlargement of the thyroid gland and a few months later exophthalmos. When I saw her at the age of 40 she was an example of severe exophthalmic goitre, with a pulse rate of 144 at the end of the examination. At about this time a hemithyroidectomy was performed on her by Mr. James Berry. I examined her again seven years later, when she was 47. She was practically free from thyroid symptoms, her pulse rate was 80, and her general condition good; but her heart was greatly hypertrophied and her systolic blood pressure high (165 mm. Hg). There was no albuminuria.

(*b*) *Slowness.*—The habitually deliberate pulse is commonly taken to make for longevity. The belief is reasonable if there is truth in the adage that it is the pace that kills, and is supported by cases like the two last mentioned if the inferences I have drawn are to be trusted. I have one fairly complete record of a slow pulse. A man had at the ages of 31 and 35 a pulse rate of 48. He was re-examined at intervals throughout his life. At the age of 46 his pulse rate was 68, at 60 it was 54, and at 67 it was 58. He died in his 72nd year from heart failure.

3. *Abnormalities of Rhythm.*

Occasional extra-systoles are common at all ages. In young and otherwise normal people, when the presumption is against degenerative affections of the heart, one can disregard them with an easy mind. But as age advances and the presumption becomes more and more in favour of an organic basis for cardiac abnormalities, it is not so easy to take a lenient view. Nevertheless, irregular hearts in people who have passed middle age may be capable of years of good service. For instance:

A man was first examined at the age of 47. His heart was normal, and he was in all respects well. A year later, at 48, he exhibited extra-systoles in some abundance. Four years later again, at 52, the irregularity persisted, but no other fault could be found. He was still alive at the age of 64, sixteen years after the first appearance of the irregularity.

Again. A man aged 58, who had an impulse in the nipple line, but not increased in force, exhibited an arrhythmia not of the common extra-systolic type. In other respects the heart sounds were natural, and he was unaware of the irregularity till it was brought to his notice. Examined again five years later, at the age of 63, he gave a history of two attacks of gout in the interval. His heart was again irregular and apparently unaltered. He was still living, in his 70th year, twelve years after the first detection of the arrhythmia.

4. *Abnormalities of Sound.*

(*a*) Systolic murmurs at the pulmonary orifice are, of course, very common among sick people, and are considered, rightly, as of little account. But they are also common among well people, and are sometimes so loud and harsh as to raise a strong suspicion of their gravity. On several occasions I have felt constrained to advise the imposition of an extra rate for these exceptionally harsh pulmonary murmurs. Yet I do not recall a single example of an untoward ending to such cases, and incline to think that even the harshest of them, in the absence of symptoms, has no ominous significance.

(*b*) Apical systolic murmurs are common, especially when the heart is emotionally disturbed. Some of these appear only at the height of inspiration, and others can only be dismissed by forced expiration. But I have had no reason to believe that these murmurs which are influenced by respiration are of any consequence. There are others about which it is hard to form an opinion as to whether they represent a leak at the mitral orifice or not. Every observer has his own standard of the quality which establishes in his mind the conviction that an apical murmur is organic, and I do not think it permits of description. But I have twice in after-years re-examined hearts which I had previously regarded as being the seat of mitral regurgitation, only to find them normal. This experience is common among sick people, but it is unexpected among those well enough to be about their business. I conclude that relative incompetence of the valve, due to lack of muscular tone in the heart, is not confined to the obviously debilitated and those suffering from recent infections, and that it is well not to be too positive as to the permanency of this murmur. Here are the instances:

A man examined at the age of 22 had what I considered to be a definite organic mid-systolic murmur, without any history of precedent illness. Ten years later his heart appeared to me to be perfectly sound.

A man was declined for life assurance, on the score of his heart, at the age of 25. The following year I examined him and considered that he was suffering from leakage at the mitral orifice. I re-examined him two years later and could find no fault in his heart beyond a suggestion of increased force in the impulse.

I have notes of a third case. At the age of 32 a man was considered (by a very experienced examiner with whose standard I am well acquainted) to be suffering from mitral regurgitation. His heart's action was excited, but this was specifically discounted in the record. There was a systolic apical murmur, audible also in the left posterior axillary line. Twenty-three years afterwards I examined him, at the age of 55, and could detect no fault. The original examiner, seeing this man again at the age of 61, passed his heart as healthy.

(*c*) There is occasionally to be heard over the base of the heart a loud, almost humming, systolic murmur—very striking indeed. This murmur is banished by a deep breath and shows no disposition to recur. I do not know its explanation, but it is of no consequence. Conversely, there is another murmur called into being by deep inspiration. It is systolic in time, and heard immediately below the clavicles—a harsh murmur, resembling that heard over a traumatic aneurysm. It is of no moment, and is due, I fancy, to distortion of the great vessels at the root of the neck by the muscular or fascial tension set up by deep breathing.

(*d*) It is well known that mild mitral regurgitation may be regarded favourably, especially when it can be definitely ascribed to rheumatic fever in the remote past. I have notes of a man who had rheumatic fever at the age of 19. When I saw him, at the age of 51, his heart was the seat of a pronounced apical regurgitant murmur without hypertrophy. This, it is to be presumed, had been in existence for 32 years—that is, since his rheumatic fever—and had given no trouble, nor promised any. Another had been rejected at the age of 32. I examined him when he was 40. He then had mitral regurgitation. Thirteen years later I examined him again. He was then 53, and his heart had undergone no perceptible change and was behaving well.

(*e*) Aortic valvular disease is justly regarded with more apprehension, yet even here there is room for optimism,

prudently applied; and many victims of the lesion in its milder degrees live comfortably for indefinite lengths of time if they can look after themselves and have reasonably good luck. For instance:

A man who, at the age of 30, had been accepted as healthy, was examined by me twenty years later. He was then 50, had a jerky pulse, an impulse in the sixth space, just within the nipple line, a loud double aortic murmur, and albuminuria. I was intimidated and rejected him. But fourteen years later, at the age of 64, he asked that I might be made aware that he was still alive and well.

I have another note of a man, aged 75, whose mother (probably) and four brothers and sisters had died of phthisis. This man was said by his doctor to have had slowly advancing phthisis of both lungs for fifty years, and to have a systolic aortic bruit, developed within the last twelve months. Nevertheless, he was still living and "well" eleven years later, at the age of 86.

Albuminuria.

Albuminuria has long been a battleground, and has caused many hard things to be said of doctors who examine for life assurance by doctors who do not. The current teaching of the laboratory is that when globulins are preponderant the symptom is negligible. But for the present this is little more than an *ex cathedrâ* dictum, awaiting the test of time.

Meanwhile, it is certain that some albuminurias do not affect health visibly, even after many years. For example: A man, aged 49, had been found albuminuric at the ages of 17, 31, and 41; yet at 49 his urine was normal, and so was his vascular system. This may be taken to represent the probable upshot of adolescent albuminuria. But one is reminded occasionally of ominous possibilities. A man, aged 22, had been declined on account of albuminuria one year previously. I examined him, and noted nothing amiss except that the impulse was under the sixth rib, yet inside the nipple line. Three years later, at the age of 25, he died of "chronic nephritis."

But on the whole I have been more impressed (in this sphere of the presumably healthy) by the longevity of albuminurics than by the reverse event. A man, weighing more than 17 st., and subject to winter bronchitis, was albuminuric at the age of 54. Here was a case surrounded by every circumstance of prognostic gloom, except that he was temperate in alcohol and came of long-lived stock. Yet (thanks to these saving clauses perhaps) he persisted in being alive fourteen years later at the age of 68. Another was consistently albuminuric on four occasions between the ages of 55 and 66, and seemed none the worse for it. Yet another was albuminuric on three occasions between the ages of 31 and 42. This last, as I understand the modern view, ranks as a probable nephritic; for his urine, though giving a pronounced reaction with cold nitric acid, gave none with cold dilute acetic acid. None the less he declined to be damaged by his albuminuria, served with infantry during the war, and returned still albuminuric and apparently nothing the worse. His systolic blood pressure at age 42 was 120 mm. Hg.

Even when accompanied by glycosuria albuminuria may be relatively benign. A man who at the ages of 46 and 54 passed both sugar and albumin, was alive at 60 and had every outward appearance of health. At this age the glycosuria had gone; but albuminuria persisted, and signs were not wanting that his vascular system was beginning to suffer.

Albuminuria due to, or at least associated with, intemperance can be conquered by faithfulness in sobriety, even when the case looks black. A man who was grossly intemperate between the ages of 32 and 40 was albuminuric at 32 and 37, tremulous, and grossly obese. He stood 5 ft. 9 in. and weighed 18 st. 11 lb. when, at the age of 40, he gave up alcohol. Four years later he was healthy to the eye, no longer albuminuric, and had lost 2 st. in weight. So the struggle was worth while.

Glycosuria.

Glycosuria, like albuminuria, is a symptom hard to appraise, at all events within the limits of the tests admissible in life assurance work. It may be that blood-sugar estimations will throw an enduring light on this dark quarter. But here again some years must elapse before we can safely accept without reserve conclusions drawn from this source. Certain it is that some people pass sugar in fairly early life, and pass it for years without being appreciably the worse.

A man whom I examined at the age of 71 gave the following history: At the age of 30 he was told that he was suffering from diabetes by the senior physician of a London hospital. He was dieted for three months, during which period sugar was found, he believed, on many occasions. It then disappeared for good, and there was no glycosuria when I examined him forty-one years later.

Another, aged 36, and of average physique, passed urine which caused some reduction of Fehling's solution and yielded osazone crystals. He was examined again at the ages of 42 and 43, when his urine was found to be exactly as before. Yet later in the same (43rd) year of his age he passed a specimen free from sugar.

Another, of average physique, reported that sugar had been found in his urine when he was 30 years old. He was examined at 37, and was definitely glycosuric on two occasions. But at 38 and 39 no sugar was to be found.

The fat "alimentary" glycosurics who make little of their disability are well illustrated by one who, at the age of 58, passed a urine of which one drop sufficed to reduce the Fehling's solution used for the test. He came of long-lived stock, and is still living eighteen years later, aged 76.

Another fat man, at the age of 40, passed a urine which caused slight reduction of Fehling's solution. At 50 he passed a urine giving a similar reaction and yielding osazone crystals. He was almost an abstainer, and seemed well.

Another, of the same fat type, at the age of 60 passed sugar on two occasions, and on one of them albumin also. Yet he lived for twenty-two years longer, dying at 82.

But there is a reverse side to this picture, and glycosuria, apparently of the "alimentary" type, is capable of becoming malign.

A fat man was held up for life assurance on account of sugar at the age of 38. At this time, and very likely on this account, he became a total abstainer. Seven years later, at the age of 45, he was still grossly obese (5 ft. 6½ in., 15 st. 10 lb.), but his urine was free from both albumin and sugar. Yet he died of diabetes and gangrene of the scrotum at the age of 54.

This case, with others of the same sort, leads me to believe that inheritance plays an important part in determining the outcome of glycosurias of middle age. This man's mother had died at 63 of diabetic coma. Another, whose mother had died of diabetes at the age of 66, passed a reducing substance at the age of 61, but no osazone crystals could be recovered from the specimen. The reaction was accordingly disregarded, but he died of diabetic coma eleven years later, aged 72.

That there is a relation between glycosuria and arterio-sclerosis is well recognized, and in cases of this sort it is generally the vascular lesion which counts. A fat man of 56 was glycosuric, and remained so in spite of dieting. Yet he lived for sixteen years, and died at 71, not from diabetes, but from renal cirrhosis and arterio-sclerosis. Another very fat man had sugar in his urine at the age of 52, and lived nineteen years, to die of Bright's disease at 71.

It will be understood, I hope, that this little series does not claim to represent the average behaviour of the abnormalities concerned, but it gives some insight into the possibilities, especially the more favourable ones. This is the most that can be looked for, since, as I have said already, the behaviour of chronic affections is swayed by factors of too much diversity to admit of ready averaging. Take, for example, senile atheroma of the aorta, and consider the extent to which the local incidence of the lesion (which we may call chance) dictates the patient's future. Place the lesion where it spares the origins of vital arteries, and then, even though the aortic valves should suffer, the process remains relatively benign; but let it encroach upon the coronary arteries, and how different does the prognostic picture become!

The same element of chance is apparent everywhere. A fit of rage, a race for a train, a bad cold, a heavy lunch, or any one of a thousand such incidents, may disconcert a forecast legitimate enough on the physical merits of the case. And conversely, when circumstances shelter them and give them peace, lives that are damaged may remain perched—and not uncomfortably—upon the very edge of the grave for surprising lengths of time, confounding all surmises. Indeed, the longevity of invalid annuitants has passed into a proverb.

It is not to be expected, then, that even the cleverest prophet in this field will escape without stumbles, but we can do something to secure our feet. So I hope that others will be prompted to amplify this attempt to provide much-needed information on an elusive subject.

THE RELATION OF CARCINOMA TO INFECTION.*

BY

W. FORD ROBERTSON, M.D.,

PATHOLOGIST TO THE SCOTTISH ASYLUMS.

[*With Special Plate.*]

BETWEEN the years 1905 and 1909 I published, in some instances in association with co-workers, a number of papers on cancer, recording observations on the ground of which it was maintained that the disease is due to some form of infection. Two of these papers I wish specially to recall. The first, published in the *Lancet* of January 25th, 1908, was entitled a "Note on the presence and significance of certain rod-shaped bodies in the cells of carcinomatous tumours." In this paper I claimed that the rod-shaped bodies revealed by the palladium methyl-violet method in cancer cells were living organisms and at least a phase of a parasite that causes the disease. The second paper, published in the same journal on June 5th, 1909, was entitled "Experimental evidence of the infective origin of carcinoma and of the transmissibility of the disease from the human subject to the mouse." In this paper it was recorded that carcinomatous tumours developed in seven out of thirty mice fed with incubated fluid from the pleural cavity of a case of malignant pleurisy, and with similar fluid from the abdominal cavity of a case of malignant peritonitis. On the ground of this result it was contended that a living virus had been transferred from the human subject to the mouse, and that cancer was therefore of infective origin. This is all I need say about these previous investigations, and I pass to the results of new investigations to which I have devoted any spare time I could snatch from official and other necessary work during the past two years.

The method of research is to test an hypothesis. By induction from a few established facts, we can discern, more or less accurately, where the next important truth lies, and we set out to look for it. If, after a thorough search, we cannot find it, we conclude it is not there, and we abandon the hypothesis. If, on the other hand, our search proves successful, we claim that we have established the hypothesis that we set out to test. This is the method that I have followed.

In the course of many years of bacteriological work applied to therapeutic immunization I developed some special culture methods, and, with their aid, observed some facts regarding the behaviour of bacteria which, although not altogether new, have attracted little attention. One of these facts has already proved of paramount importance for therapeutic immunization, because, unless it is taken into account, the bacteriological analysis upon which the success of therapeutic immunization primarily depends must very often be incomplete. This fact is that many bacteria that we regard as aerobes commonly assume, when their attack is prolonged, an anaerobic habit of growth, and can be cultivated only under anaerobic conditions. This applies, for example, to such important pathogenic species as *Micrococcus catarrhalis*, the gonococcus, *Streptococcus pyogenes*, *Streptococcus faecalis haemolyticus*, and several types of diphtheroid bacillus. Now suppose that an anaerobic bacterium of this kind gets within a living cell, what will happen? For the present we may consider the question only in regard to epithelial cells. In all probability these cells, like the mesoblastic elements, have a mechanism of defence against foreign invaders, but that this mechanism, if it exists, is sometimes overcome can be clearly demonstrated. Suppose then that a bacterium establishes itself within an epithelial cell and multiplies. What will happen? The first possibility is that the cell will die on account of the toxic action that must ensue. It is impossible that the cell can remain unaffected by the invader, but it is far from likely that in every instance it will succumb. We know that one action of many bacterial toxins upon cells is to stimulate growth. It is possible that some types of bacteria, if established within an epithelial cell, would have chiefly this effect. The cell would be stimulated to divide, and would go on dividing, so long as the foreign element producing the toxin remained within it. It might even, after some thousands of divisions, acquire the habit of continued proliferation independently of the presence of the parasites.

With these few facts and possibilities before me, the hypothesis suggested itself that the rods I had observed within cancer cells by means of the palladium methyl-violet method might be anaerobic bacteria that had established themselves within the epithelial cells, and that the continued proliferation was due to the action of these bacteria. This is the hypothesis that I have been trying to test during the past two years, and, extravagant as it may seem on first view, the evidence that can already be brought forward in support of it is, to put it quite mildly, sufficient to arrest attention. There are at least four distinct methods by which the validity of this hypothesis may be tested. They correspond to four distinct classes of possibly procurable evidence that may serve to establish or to refute it.

The first is the method of direct examination of cancer cells. We can make microscopical preparations of carcinomatous tissues, and endeavour to determine if we can observe in the epithelial cells any bodies corresponding in their general characters to bacteria. A thousand negative observations of this kind are valueless before one set of positive observation made by a special technique that consistently gives the same result when widely applied. Many years ago I worked for months endeavouring to discover a process that would give a positive result, and at last elaborated the palladium methyl-violet method. It gave its answer, and I demonstrated the results before scientific societies and published a paper. The method is a permanent one, and the sections, some of which are under the microscopes to-day, are as clear as they were fourteen years ago. The bodies observable are minute rods, resembling bacilli; there is evidence that they occur chiefly within the nucleus, and that when they are thrown out into the cytoplasm, as they may be during division of the cell, they display a chemiotactic attraction towards the nucleus. The infected cells occur in special areas; throughout the greater part of the tumour it may be impossible to observe any of these rods. On the ground of these results, obtained fourteen years ago, I maintain that the evidence of the method of direct examination supports this hypothesis of epithelial cell infection.

The second method is that of artificial cultivation of the supposed bacteria. If there are living micro-organisms within cancer cells, it may be possible to obtain growths of them by suitable methods. Here again thousands of negative results are valueless against a positive demonstration by a special technique that gives consistent results in a series of cases. The evidence of this kind that I have obtained is, perhaps, not so decisive as that of each of the other three methods, but it is, I think you will admit, sufficiently striking. The results suggest that it is necessary to widen the hypothesis that is being tested. They would seem to indicate that not one species of bacterium but several species belonging to a group are capable of causing cancer.

It is necessary that you should understand the methods I have used. Only those now found to be of most service need be mentioned. I use haemoglobin agar slopes of various degrees of acidity, set up anaerobically by the pyrogallic acid method. This mode of culture is, however, only of limited service. An anaerobic fluid medium is essential. The one that I have now used for several months is prepared as follows: One part of fresh serum of the sheep is added to 5 parts of sterile normal salt solution in a large test tube and incubated for twenty-four hours. If the fluid remains clear, it is next decanted into small tubes, which are filled to about 1 in from the top. With the cotton-wool plugs inserted, the tubes are placed together in a suitable bottle, and the air in this is exhausted by means of the Geryk pump for two days. The tubes are then taken out and immediately sealed by dipping the plugs in melted hard paraffin and replacing them. The tubes are next incubated for ten days at least. They are then numbered, and the fluid in each is decanted into a series of similar tubes, which are immediately sealed with paraffin. The number of the original tube is written on each. A small amount of the deposit remaining in each original tube is then examined microscopically by the staining method used in the subsequent

* A paper read in the Section of Pathology and Bacteriology at the Annual Meeting of the British Medical Association held in Newcastle-on-Tyne, July, 1921.

study of cultures, and the decanted fluid in the tube with the corresponding number is passed as fit for use, only if the deposit gives a negative result as regards the presence of micro-organisms. After a few days' further incubation the decanted tubes, if they remain clear, are put aside in the cold and are ready for use.

Cultures are best made from scrapings of a freshly cut surface of the tumour. Incubation of the solid and fluid media has generally to be continued for from two to six weeks. Any colonies appearing on the solid media are examined in the usual manner. Growth in a fluid medium shows itself as a deposit or as minute white particles adhering to the glass. Before examination the fluid is centrifuged. The tube is then unsealed by heating the plug in a Bunsen flame. The fluid is decanted into another tube, which is immediately sealed with paraffin. It is of advantage to wash the deposit with distilled water and to centrifuge a second time. The deposit is then stained and examined. I have found Gram-neutral red staining the most serviceable, but some of the bacteria studied have required heating of the stain in order to obtain a satisfactory result.

I have made cultures chiefly from mammary cancers removed by the surgeon. For most of the specimens I am very greatly indebted to Mr. W. J. Stuart. For others I have to thank Professor Alexis Thomson, Mr. Alexander Miles, Mr. J. M. J. Hartley, and, I believe, one or two others who forgot to give their names when sending me the specimens by post. In several instances, as might be expected, the tumours showed common bacterial sepsis. *Streptococcus pyogenes*, staphylococci and aerobic diphtheroid bacilli were the most frequent contaminating micro-organisms. By far the larger number of specimens were, however, free from anything that can, I think, be rightly regarded as bacterial contamination. In many instances tissues that appeared sterile under aerobic conditions yielded colonies of diphtheroid bacilli, and less frequently of staphylococci, under anaerobic conditions. On first view these growths might also be regarded as the result of simple contamination, but, as I shall presently explain, they may have a different significance. A large proportion of the tumours yielded no growths on surface media, either under aerobic or under anaerobic conditions, but gave a positive result in an anaerobic serum broth, or in an anaerobic serum salt solution medium. The actual number of cases examined does not matter at this stage of the investigation, because many of the earlier observations were tentative and carried out with a technique that has been abandoned. The following is a summary of the positive results to which, in view of the testimony of the other three methods, I believe there is reason to attach importance.

From eight carcinomata of the breast removed by the surgeon I have obtained, under anaerobic conditions in a serum broth, or in a serum salt solution medium, growths of bacillary bodies resembling the rods observed by means of the palladium methyl-violet method in sections of similar tumours. These micro-organisms would not grow on a haemoglobin agar surface, either aerobically or anaerobically. Stained by the heated Gram-neutral red method they appear as minute granular rods incompletely Gram-fast. Stained with an acid solution of methylene blue, they are seen to contain minute metachromatic granules. On this account they must be classed as bacilli of the diphtheroid group.

From twelve carcinomata of the breast removed by the surgeon I have obtained colonies of anaerobic diphtheroid bacilli upon a haemoglobin agar surface. Similar growths have been obtained from five other carcinomatous tumours, including a rodent ulcer recently excised by Mr. Miles. The rule has been that only one of these two forms has been obtainable from a tumour. The only other bacterium that has been found with any frequency in anaerobic cultures from what could be regarded as uncontaminated tumours has been a staphylococcus, not *pyogenes*, but one belonging to the mannite non-fermenting subgroup. Such results tell us nothing as to the relation of these bacteria to the growth of the tumour. As will be seen, however, they furnish an important link in the chain of evidence.

The third method is that of the experimental production of cancer. If this hypothesis that I have set out to test is correct, it may be possible to show that the bacteria isolated from human carcinomata have the power to produce tumours in lower animals. I have sought the evidence of this method under no small difficulty. On account of the limited facilities at my disposal, I have been obliged to work only with mice. My experiments are still in progress, but already they have yielded many positive results.

A consideration that should, I think, be kept in mind in this connexion is that there must be a certain natural power of resistance to bacterial attack on the part of the epithelial cell, and that it may be only occasionally that this can be overcome. In the mouse, as in the human subject, there may be important factors that weaken the resistance of the epithelial cell to such attack.

I have varied my experiments in many ways, endeavouring to find a method by which it may be possible to produce tumours in a high percentage of animals. Simple hypodermic injection of the living cultures, injection into the mammary region, feeding, inoculation by scarification and genital tract infection have all been tried. Many of the experiments set up have not yet yielded their complete results. I should say that I have a large number of control animals, and that none of them have so far developed any tumour. The following are some of the results already obtained:

One of six mice inoculated by scarification in the ear with an anaerobic diphtheroid bacillus, isolated from a case of inoperable epithelioma under the care of Dr. Arthur Wilson, after about six months developed a large tumour at the junction of the neck and chest. It proved to be a rapidly growing carcinoma, probably arising from mammary gland tissue.

Four female mice were injected in the mammary region with a culture of an anaerobic diphtheroid bacillus isolated from a mammary carcinoma. Two of the animals were lost through the carelessness of a temporary custodian when I was on holiday. Of the two that remained, one died after five months; it showed no tumours. The remaining one developed great abdominal swelling, and was killed about ten months after the commencement of the experiment. It was found to have a large solid tumour of the pancreas. Both ovaries were also converted into large solid tumours, and there were secondary nodules in the liver, spleen, lung, and anterior mediastinum. All of these tumours have the same structure, that of rapidly proliferating epithelial cells without adenomatous arrangement.

Four female mice were injected in the mammary region with a culture of an anaerobic diphtheroid bacillus obtained from another carcinoma of the breast. No. 2 began to show abdominal swelling after nine months, and was killed two months later when in a moribund state. In the position of the left horn of the uterus there was a large abscess which had destroyed most of the tissues that might have previously occupied its site. There was a small tumour in the lung, and I suspected that the abscess had been superimposed upon a tumour of the ovary or uterus. Investigation of the tissues behind the abscess revealed the presence of adenomatous tissue, such as might have arisen from the epithelium of the uterus. The tumour of the lung has the same adenomatous structure. I think the evidence conclusively shows that this was a case of carcinoma of the left horn of the uterus that had become infected by a coliform bacillus. Mouse No. 1, after about twelve months, developed a very rapidly growing tumour of the neck similar to that already described in another mouse. The other two, which were killed and examined, showed no tumours.

Eight female mice were the subjects of the next experiment. Nos. 1 and 2 were injected in the mammary region with cultures of an anaerobic diphtheroid bacillus obtained from a carcinoma of the breast. No. 3 was similarly injected with a culture of a mannite non-fermenting staphylococcus. Nos. 4 to 8 were injected with both micro-organisms. After fourteen months nothing has happened to Nos. 1, 2, and 3. No. 6, after seven months, developed a rapidly growing tumour of the buttock and was killed about nine months after the experiment began. This tumour has the structure of an adeno-carcinoma. No. 4 was observed to be sickly after about twelve months, and was killed with chloroform. It was found to have a large tumour of the right kidney and a smaller one of the left. Both are rapidly growing epithelial tumours, with distinctly adenomatous structure. No. 8 was noticed to have a palpable tumour in the abdomen. This gradually increased in size and the animal was found dead about a

year after the experiment began. It had a tumour in the abdomen of the size and shape of a date stone, evidently taking origin from the pancreas. There was a secondary nodule in the spleen. Both tumours are composed of epithelial cells of the character of those that might be expected in a malignant tumour arising in the pancreas. The remaining two mice were noted for several weeks to be greatly swollen about the abdomen, and hard tumours were felt in both. The animals were recently killed, and both were found to have great enlargement of the uterus, with nodular swellings. In each case the structure is that of an adeno-carcinoma. The results of this experiment would suggest that the association of a particular species of anaerobic diphtheroid bacillus and of mannite non-fermenting staphylococci has some special potency in the production of tumours. It will be observed that all of five mice subjected to this method of experiment developed cancer.

The nipples of a mouse with suckling young were smeared with the centrifuge deposit from an anaerobic serum broth culture containing a diphtheroid bacillus of the kind that will grow only in an anaerobic fluid medium. This growth was derived from a carcinoma of the breast. The idea underlying the experiment was that the bacteria might reach the mammary gland through the lacteal ducts. No mammary cancer developed, but, after about nine months, the mouse was found to have a large fungating tumour over its sternum. This tumour has the structure of a squamous epithelioma.

Several other experiments have not yet had time to yield their final result. On April 6th six mice (three adults and three half-grown ones) were injected hypodermically in the back with a primary serum salt solution culture of an anaerobic diphtheroid bacillus obtained from a carcinoma of the breast. Two of the three young mice died from pneumonia within eight weeks, and cannot be reckoned in the experiment. Of the four that remained, two have already developed carcinomatous growths. Two months after the commencement of the experiment, mouse No. 2 was observed to have a small fungating tumour of the skin at or near the site of the injection. This tumour steadily enlarged. Five weeks later the animal was found to be in a moribund condition, and it was therefore killed under chloroform. The tumour of the skin has the structure of a squamous epithelioma. The illness on account of which I was obliged to terminate the experiment was clearly dependent upon a remarkable lesion of the kidneys, both of which organs were enlarged, granular on the surface, and extremely pale. On microscopical examination I found that, scattered among the tubules, there were numerous small masses of rapidly proliferating epithelial cells. That the lesion is of the nature of an early carcinomatous one is, in my opinion, certain, but whether the new growths are primary or secondary to the squamous epithelioma of the skin is not clear. Mouse No. 1 was killed under chloroform two months after the experiment began because of an abscess in the region of the ear, which probably had nothing to do with the inoculation. The right ovary was found to be enlarged to about ten times its normal size. It shows a tumour, composed of large epithelial cells, rapidly proliferating. One of four mice, inoculated by scarification in the back with a culture of an anaerobic diphtheroid bacillus isolated from a rodent ulcer excised by Mr. Miles, has developed a spreading ulcer at the seat of inoculation, which after ten weeks has attained the breadth of about a quarter of an inch and a length of half an inch.

The fourth method of investigation is that of focal reaction and therapeutic immunization. If cancer is associated with bacterial infection it is possible that the injection of an exact dose of the corresponding bacterial toxin will be followed by a focal reaction in the tumour, and that upon the occurrence of such focal reactions there may be based a successful method of therapeutic immunization. In regard to this method of investigation also there is a consideration that requires to be borne in mind—namely, that, if this hypothesis is correct, it may be taken as certain that it is not always the same bacterial species that is at work, and that, consequently, a stock vaccine may fail to produce a focal reaction, simply because it is not the right one for the case.

Notwithstanding this limitation of the possibilities of success, positive results have been obtained in several cases. I shall briefly relate some of the most striking facts observed. Dr. Arthur Wilson, who was the first to observe focal reactions of the kind I am about to describe, has permitted me to make use of the two following observations.

A gentleman, about 50 years of age, suffered from an epitheliomatous growth within the meatus of the ear. It was operated upon, but soon afterwards recurred. A more extensive operation was undertaken, as the glands in the neck had become involved. Again recurrence took place, and further operation was considered out of the question. From the discharge from the ulcer I obtained an anaerobic diphtheroid bacillus of some vigour, and from this I prepared the vaccine that was used by Dr. Wilson. When treatment was begun there was a long scar, consequent upon the second operation, extending from behind the ear downwards. In the line of this scar several hard secondary growths had developed. In addition, underneath the angle of the jaw there were two large nodules, each the size of a walnut. Discharge continued from the meatus. With each dose of vaccine the patient had temporary aggravation of pain and increased discharge tinged with blood. With continuation of the injections the amount of pain he suffered gradually diminished. The nodules in the line of the scar disappeared. One of them broke down and suppurated. It was swabbed out with iodine, and healed absolutely by first intention. The two large nodules in the neck, in front of the scar, also disappeared. The prospects in this case seemed exceedingly bright, when unfortunately the patient developed erysipelas in the wound, and from this he died. In view of the accumulation of observations pointing to the infective origin of cancer it is of considerable interest to know a tragic sequel to this case. The patient's wife nursed him through his illness and daily dressed his wound. Up till nine months after his death she was apparently in good health. She then sought advice on account of symptoms that required a pelvic examination. It was found that she had cancer of both ovaries and large secondary growths involving the intestine. Her death occurred a little over a year after that of her husband.

Dr. Wilson's second case in which therapeutic immunization has been tried is that of a lady who was discovered to have a carcinoma of the rectum, which was regarded as inoperable. Colostomy was performed. Dr. Wilson informs me that he has now given ten injections. The vaccine used was one prepared from a serum salt solution culture from a scirrhous cancer of the breast. Each dose has been followed by a general and a focal reaction. The general reaction has manifested itself simply in malaise, lasting generally for about two days. It has been found impossible to increase the dose above 0.04 mg. A focal reaction has been evidenced by a sensation of fullness in the rectum and by increase of discharge of mucus which has been tinged with blood. The patient has now gained nearly a stone in weight. The most gratifying feature of the case is, however, the abatement of her sufferings, which were acute up to the time when therapeutic immunization was begun.

Mr. W. J. Stuart has kindly given me notes of observations made in three cases treated by vaccines. Two were carcinomata of the breast with extensive recurrence after operation. In both of these it was clearly observed that a vaccine dose was followed by increased tenderness of the affected glands. No distinct improvement was noted as the result of treatment. The third case was one of carcinoma of the rectum, in which colostomy had been performed. In this patient there was a distinct general reaction after each dose, manifested by feelings of malaise and chilliness. The patient also reported signs of a focal reaction consisting in "a greater feeling of rectal drag and more rectal discharge on the second day." His general health remains good, but the rectal tumour seems to be growing. At a discussion on this subject that recently took place in Edinburgh, Dr. A. Graham Ritchie described violent focal reactions he had observed in several cases of advanced carcinoma under his care.

Through the kindness of the physicians of the West House, Royal Edinburgh Asylum, I have had an opportunity of making an observation in a case of ulcerating carcinoma of the breast in a female dement. Last summer injections were given of from 0.1 mg. to 0.26 mg. of a vaccine prepared from an anaerobic diphtheroid bacillus obtained from a breast cancer. Four successive injections were each followed next day by severe congestion of the tumour, accompanied by profuse haemorrhagic discharge. The most severe reaction followed the fourth injection of 0.26 mg. It was distinct after twenty-four hours, but subsequently increased in severity, lasting four days and terminating with severe haemorrhagic effusion from the ulcer. In all, ten injections were given. During this time the tumour and the ulcer diminished in size. The patient has gained weight, and though senile, remains in fairly good physical health. The tumour has ceased to grow.

In a case of uterine cancer, under the care of Dr. Robert Robertson, a vaccine prepared from one of the more vigorous strains was also used. The injections began

with 0.02 mg., and the dose was gradually increased to 0.08 mg. Haemorrhage had never been a symptom in this case. Each of the first four injections was followed next day by profuse haemorrhage from the tumour. The patient seemed to improve. The fifth injection was, however, followed, not by haemorrhage, but by severe malaise, which continued for many days. The injections were stopped and the patient was sent to Longmore Hospital for Incurables. What became of her I do not know. The interest of the case lies chiefly in the distinct focal reactions following the injections.

Two cases observed by Dr. Alexander Dey of Wooler are also of interest. He used a vaccine prepared from a primary serum broth culture of an anaerobic diphtheroid bacillus obtained from a case of carcinoma of the breast. The strength was only 1 c.cm. = 0.1 mg. The following is Dr. Dey's report on the first case:

A woman of 50, whose breast had been excised, and who, eighteen months later, had recurrence in the cicatrix and in the armpit, was feeling so generally ill that she spent most of her time in bed. After she had had three or four weekly doses she got such a general feeling of well-being and strength that she was able to be about with comfort. She always had, about thirty-six hours after the dose, what she called feverishness and discomfort, but after that, for the rest of the week, she was wonderful. The swelling in the armpit ceased to grow and the cicatrices looked healthier. I attempted to increase the dose slightly, but the reaction was so pronounced that I had to go back to the original dose (0.2 c.cm.), and on the last two occasions she had such severe headache and throbbing in her head that she became so alarmed that she would not let me give her any more. She admits, however, that she feels so much better that she knows the vaccine has done her good. So far the growth is certainly arrested. . . . The case, I consider, is highly encouraging on account of the definite arrest of the growth and the feeling of well-being the patient got after the reaction stage had passed. It was peculiar that the reactions got severer with repeated injections.

I have heard that this case afterwards relapsed, and terminated in the usual way. The sudden or gradual increase of sensitiveness to the vaccine in this case and the preceding one are remarkable features which it may be difficult to explain. I have occasionally observed a similar occurrence in the course of other forms of therapeutic immunization. In these cases it can be satisfactorily met by simply diminishing the dose to about one-tenth, and it is probable that, when it occurs in cases of carcinoma, the same remedy will be found to be applicable. Dr. Dey's second case is more encouraging. He reported to me on February 24th last as follows:

The case was that of a working man who had been through the war, about 34 years of age, whom I sent to Mr. G. Grey Turner of Newcastle, suffering from what I considered cancer of the rectum, in the autumn of 1919. Mr. Turner operated and verified the diagnosis microscopically. Last May I sent him back to Mr. Turner, who found what he thought a recurrence, and sent him back to me to watch for any secondary growth before doing a colotomy. After I got the vaccine, I thought he was a good case, and have given him weekly doses till January, having increased the dose very slightly. In January I sent him to Mr. Turner, who examined him very carefully, and the recurrence which he found in May had disappeared, leaving a small nodule which Mr. Turner considered to be cicatricial tissue. . . .

The last case I wish to refer to is that of a large rodent ulcer in a female dement at the Royal Edinburgh Asylum. This patient has recently had six injections of a vaccine prepared from the anaerobic diphtheroid bacillus obtained from the rodent ulcer excised by Mr. Miles. To each of the first four injections she reacted in the tumour with congestion and increase of discharge, and after all except the first injection (which was probably too small) there was haemorrhage from the whole circle of the edge of the growth. The ulcer has now assumed a healthier appearance than it has ever been observed to have before. The formation of crusts has entirely ceased.

The results obtained by pursuing these four separate lines of investigation warrant, I think, the statement that there is strong evidence in support of the hypothesis that cancer is dependent upon cell infection by anaerobic bacteria. If this hypothesis can be accepted, a number of important interpretations of phenomena observed become possible, and with a word or two about these I will conclude.

There would appear to be a race of anaerobic bacteria comprising several species belonging to the large diphtheroid group or to the closely allied streptothrix group, which are capable of infecting epithelial cells and maintaining within them a parasitic existence. Many facts point to the conclusion that we have to deal with a group of the higher bacteria that appear in several forms. There are some rounded or oval bodies that may occasionally be seen in the cultures which cannot be called either bacilli or micrococci, but which are not incompatible with the known polymorphism of some of the higher bacteria, especially the streptothrices. The interpretation of these bodies, already seen and described by several observers, will probably become clear as the result of further cultural and experimental work.

It is probable that bacteria of other groups are capable of acting in the same way. If this is so, cancer may have to be regarded as dependent upon a special mode of bacterial attack, rather than upon a specific infection. The effect upon the epithelial cell is to stimulate it to proliferate, and the result is a tumour varying in character in accordance with such factors as the type of epithelial cell, the bacterial species, and the reactive qualities of the host.

There are important conditions that render the epithelial cells more vulnerable and permit the initial invasion. Exposure to infection must be very common. Successful attack on the part of the bacterium must be comparatively rare; it is probably rendered possible only by the operation of some cause that weakens the resisting power of the cell. Long-continued proliferation of epithelial cells from any cause must render them more easily invaded by bacteria of the kind I have described. Many well known clinical facts are in harmony with this view.

Tumours that have developed to any considerable size are not uniformly infected; there remain only foci of infection, and the difficulty of obtaining successful cultures is increased by this circumstance. Invasion of the cell would appear to be effected, as a rule, by bacteria of comparatively vigorous growth and easy to cultivate, but when these bacteria adapt themselves to purely parasitic intracellular growth they become comparatively feeble and extremely difficult to grow in culture media. They cease to be capable of growth on any surface medium yet tried, but they can generally be cultivated in an anaerobic serum diluted with normal salt solution. Tumours can be produced in mice by both the vigorous and the feebly-growing strains. Focal reactions can be obtained in some cases, success probably depending upon the vaccine having been prepared from the same species as that in the case. The possible diagnostic value of such reactions is a question for future investigation. The prospect of being able to exercise some control over the growth of cancer by means of therapeutic immunization is distinctly good.

My attention has recently been drawn to the work of Loeb upon the influence of the endocrine glands on the growth of cancer in mice. It seems to me, however, that his results tell us nothing regarding the cause of cancer, although they may prove of much importance for its treatment.

DISCUSSION.

Dr. JAMES A. MURRAY (Director, Imperial Cancer Research Fund, London) said that he would state the objections that occurred to him against the argument that Dr. Ford Robertson's diphtheroid bacillus was the cause of cancer. In the first place, mammary tumours in mice were common. It was interesting that none had occurred in Dr. Robertson's controls, but that did not exclude the possibility of their spontaneous development in the inoculated animals. It was well known, however, that any form of chronic irritation might give rise to cancer, and Dr. Murray was quite prepared to admit a non-specific relation between tumours and bacteria. A point against the specificity of Dr. Robertson's organism was the very great variability in the length of the incubation period in the experiments—that is, from a few weeks up to eighteen months.

He had seen the bacteria-like structures in the tumour cells when they were demonstrated at Oxford fourteen years ago; he held then, as he still did, that they were not bacteria. There were so many intracellular structures, such as mitochondria, which could be mistaken for organisms, and under pathological conditions the intracellular appearances might alter considerably. No evidence had been forthcoming to prove that the rod-like structures were bacteria. Dr. Murray mistrusted metallic impregnation methods for the demonstration of special structures.

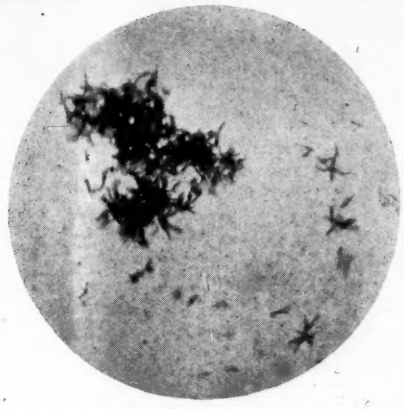


FIG. 1.—Rod-shaped micro-organisms in serum salt solution culture from a cancer of the breast. Ziehl-Neelsen staining. (× 1,000.)

FIG. 2.—Mouse showing tumour of buttock, seven months after subcutaneous injection with anaerobic diphtheroid bacillus isolated from a cancer of the breast.

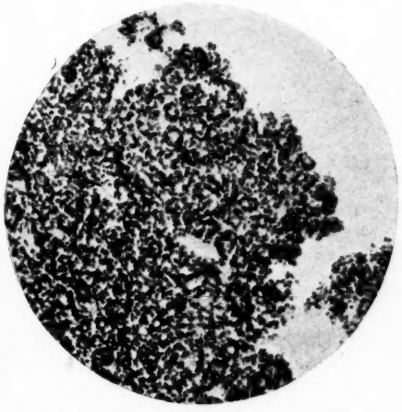


FIG. 3.—Section of tumour shown in Fig. 2.

FIG. 4.—Spreading ulcer on back of mouse, eight weeks after inoculation (by scarification) with culture of an anaerobic diphtheroid bacillus isolated from a rodent ulcer.

A. G. GIBSON: PATHOLOGY OF GASTRIC AND DUODENAL ULCER.

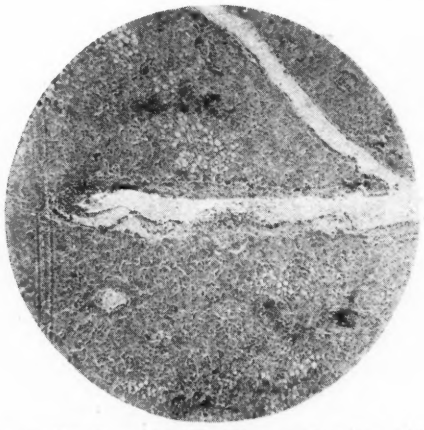


FIG. 1.—Section from the liver of a monkey the subject of an experimental infection, showing a patch of endophlebitis in one of the branches of the portal vein.

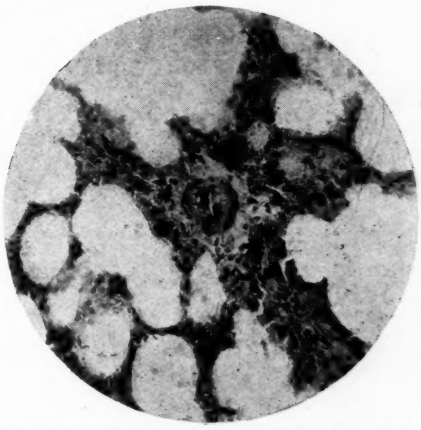


FIG. 2.—Section of the lung of a monkey the subject of an experimental infection, to show the almost complete obliteration of one of the branches of the pulmonary artery in the neighbourhood of one of the haemorrhages.

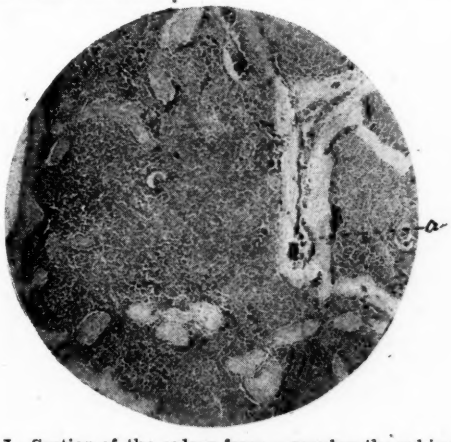


FIG. 3.—Section of the spleen from a monkey the subject of an experimental infection, to show the great increase in the number and size of the trabeculae and a vein (*a*) showing endophlebitis.

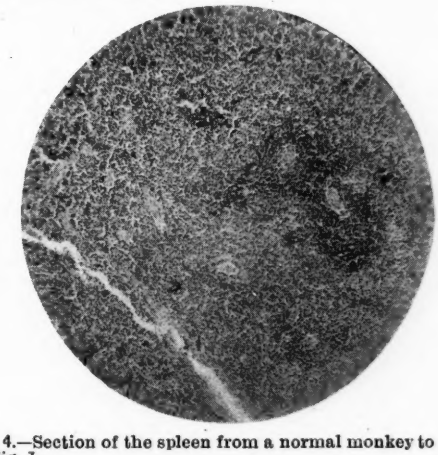


FIG. 4.—Section of the spleen from a normal monkey to compare with Fig. 3.

FIG. 1.—View from the north end of the machine-room, showing (*a*) the radial crane for handling bales of infected materials; (*b*) a machine for automatically feeding wool from the bales into the first process machine with duct by means of which dust is extracted from the automatic machine and conveyed to the boiler furnaces; (*c*) the range of disinfecting machines beginning with the three first process bowls.

FIG. 2.—View showing the two second process bowls of the disinfecting machine in which wool is submitted to the action of formaldehyde. The two bowls are completely closed in by means of a glazed cover. The duct for conveying dust from the automatic feeding machine to the boiler furnaces is also shown, and in the distance the three first process bowls.

They were very uncertain in their action. One never knew whether the whole or only part of a structure would be impregnated. One part of a section might stain beautifully, while similar tissue near by might be only partly coloured or not at all. Much concerning the minute structure of cells was still obscure. A combination of morphology and staining reactions was needed in deciding histological questions. Another point against Dr. Robertson's theory was that there was no constant relation between the site of inoculation and the site of the tumour. Scarification of the ear did not, for instance, explain the occurrence of a tumour in the mammary gland or uterus. Dr. Murray thought that the failure of the site of the tumour to correspond in all cases with the site of inoculation, together with the variability in the incubation periods, was strong evidence that Dr. Ford Robertson's bacillus was not a specific cause of cancer.

Mr. McADAM ECCLES (Surgeon, St. Bartholomew's Hospital, London) said that Dr. Ford Robertson's paper was of the greatest importance, and was another link in the chain of evidence of the infective origin of carcinoma. As an operating surgeon frequently dealing with carcinomata, such scientific investigation of the cause of carcinoma was of particular and practical importance. All the material investigated appeared to have been from a neoplasm which might have been infected from the surface, the mamma through the ducts in the nipple, the rodent ulcer, etc. If similar results were to be obtained from a carcinoma which had arisen in a "buried" organ, say a testis, it would be a very striking fact.

The infection of and subsequent development of an epithelial growth in so many mice was of the greatest value. He ventured to throw out the suggestion that because mice were the animals most easily infected with later growths, might they not be a possible source of the bacteria which infect the human, seeing also that they were with us everywhere, and did not hesitate to run over and help themselves to our food? Had any of the tumours arising "spontaneously" in the mammae of mice shown any of these distinctive bacterial-like structures?

Dr. FORD ROBERTSON, in reply, said he desired to acknowledge the kindliness with which Dr. Murray had criticized views that were completely at variance with those advocated by him for many years. The evidence he had put before them, and that of the twenty-one microscopical preparations laid out in another room, remained, however, untouched by anything that had been asserted.

THE PATHOLOGY OF GASTRIC AND DUODENAL ULCER.*

BY

ALEXANDER G. GIBSON, M.D., F.R.C.P.,

HONORARY PHYSICIAN TO THE RADCLIFFE INFIRMARY, OXFORD, AND LECTURER ON MORBID ANATOMY IN THE UNIVERSITY.

[*With Special Plate.*]

ONE aspect of the production of gastric ulcer has recently come before me in doing experimental work with an organism mildly pathogenic for monkeys. The organism, a streptothrix of the species actinomyces, was obtained from a case of acholuric jaundice, and has been described in the *Journal of Pathology and Bacteriology, Edinburgh*, 1920, xxiii, 357. If a culture in broth be injected intraperitoneally into a monkey (preferably not rhesus) the animal suffers no inconvenience for a month or two; subsequently, however, it becomes less active, tends to sit crouched in a corner, and gradually fails in health during a period which may be as much as a year. There is not, so far as my observations go, any anaemia, but the animal is certainly paler in the late stages, may be puffy under the eyelids. The appetite is preserved throughout. Rigors are sometimes seen. There is usually some tenderness elicited over the spleen, and this may be enlarged and tender.

One of these monkeys, a male callithrix of moderate size, was injected on three occasions intraperitoneally with a broth culture of the streptothrix. The animal preserved its condition and kept up its weight for seven months, after which it quickly failed, and was killed thirty-two weeks (224 days) after the first injection. During the period of observation the animal was more apathetic than the controls, and for the last four months sat crouched in one corner of the cage. On palpation of the abdomen tenderness was first noticed six weeks after the first injection, and, except on one occasion, could always be elicited, more usually over the spleen, sometimes over the liver, and once or twice elsewhere. The spleen was felt throughout, but could never be said to be enlarged.

Blood counts, taken several times during the experiment, showed a gradual increase in the red cells and a slight increase in haemoglobin, not in excess of the control animals. An increase in the mononuclear count was also shown in this and the controls. The fragility was not raised. The necropsy, made immediately after death, showed no peritoneal abnormality. The spleen was extremely small and shrunken. On opening the gut the contents were black and pultaceous, mostly in the caecum and first part of the colon. There were several circular ulcers of the stomach with sharp borders not confined to any area, measuring up to nearly a centimetre across, showing blood altered by gastric juice. The black substance in the colon gave the reaction for occult faecal blood. The small intestine showed several hyperaemic and haemorrhagic patches, and a similar patch on the point of ulceration was found in the appendix. There was ulceration of the first part of the ascending colon. The spleen was in a marked condition of fibrosis with thrombotic changes in some of the veins. The liver was very pale and fatty, and showed towards the edge in one part two small areas suggesting contracting infarcts, and on the under surface were two shrunken, slightly haemorrhagic patches suggesting an area of ischaemic atrophy. On section the liver showed general fatty change and much bile staining near the bile passages. The lungs showed numerous haemorrhagic areas, and small haemorrhagic areas were also to be seen in the mesentery. Cultures made from the spleen, liver, and lung, heart blood and pericardial fluid, were negative. Shortly, this animal showed a chronically inflamed and fibrotic spleen with thrombo-phlebitis, multiple gastric ulcers, and haemorrhagic embolic lesions of the liver and lungs.

The venous blood from the spleen may return to the portal vein by two channels, either by the splenic vein or by the vasa brevia of the stomach wall; this latter channel is probably the normal one for a large amount of splenic blood. In fact, Mayo quotes 30 per cent. as the proportion of splenic blood that returns in this way (W. J. Mayo, *Contributions to Medical and Biological Research*, dedicated to Sir William Osler, ii, 991). The gastric veins must therefore be freely open to any substances, embolic or not, that may emerge from the spleen. If emboli are infective, it is not difficult to imagine that some may attach themselves to the wall of the vessel and produce a weakening and haemorrhage from it.

Acholuric jaundice is a condition that usually gives rise to no gastric symptoms beyond vomiting, and I have only been able, so far, to find one reported case that suffered from haematemesis (Box, *Proc. Roy. Soc. Med.*, Clin. Sect., 1913, vi, 8); but acholuric jaundice is very nearly related to splenic anaemia, and both are undoubtedly due to an infective agent whose site is the spleen. Why in the one type we should see progressive inflammation of the spleen with anaemia and jaundice, while in the other there is anaemia and haematemesis is not known. Be that as it may, the facts are that from an inflammatory lesion in the spleen both types follow, for splenectomy in the earlier stage cures both diseases. In the clinical group of cases known as splenic anaemia there is an enlarged inflamed spleen and a tendency to periodic gastric haemorrhage which may be so great as to be fatal. The origin of the bleeding is sometimes from dilated oesophageal varices, sometimes from lesions in the stomach which are described as erosions; such lesions, however, give rise to such blanching haemorrhages that we must presuppose a leakage from one of the large vessels of the stomach wall. It is curious that clinically such haemorrhages are seldom followed by the symptoms that we have come to look upon as characteristic of gastric ulcer, and must be related to

* A paper read in the Section of Pathology and Bacteriology at the Annual Meeting of the British Medical Association held in Newcastle-on-Tyne, July, 1921.

the fact, now sufficiently well observed, that in an otherwise healthy stomach ulcerative lesions produced by destruction of the mucous membrane quickly heal.

The gastric ulcers commonly met with clinically have very different causation in different cases; experimental work has shown that ulcers arise in the stomach in a variety of ways. In bringing the present observations before your notice I do not wish it to be thought that even a small proportion of clinical gastric ulcers are produced in this way. For this we must suppose a general or an intestinal infection or some such mechanism as Charles Bolton has so admirably worked out for a specific gastro-toxin. But we know rarely of the origin of ulcer in septicaemia, pyaemia, endocarditis, and a large number of other infective processes, both general and local, in which emboli or metastatic infective material may be brought to the stomach wall and produce an amount of necrosis of the mucous membrane that may give rise, after action of the gastric juice, to macroscopic ulceration.

In the instance here described we have a similar process. The spleen in the experimental animal, as in the human disease, shows a thrombo-phlebitis, as has been drawn attention to especially by Dock and Warthin in human cases of splenic anaemia. In some cases of the human disease this phlebitis is so massive as completely to obstruct the portal vein. In other cases, however, it is merely sufficient to thicken the efferent channels. The presence of thrombo-phlebitis in the splenic venules produces from time to time emboli which, travelling by the main splenic vein, are held up by the liver. That this is so is proved, first, by the evidence of what appear to be minute infarctions in the liver of the monkey. Unfortunately, I have so far not been able to get definite evidence of recent phlebitis in the radicles of the portal vein in the liver, owing to my desire to obtain as much material as possible for culture. But in Fig. 1, a section from the liver of a monkey the subject of a similar experiment, there is seen a localized area of phlebitis in a venule in the liver almost blocking the lumen. In this last experiment I have obtained a pure culture of the streptothrix from the spleen pulp.

On these grounds, remembering also that 30 per cent. of the splenic blood returns via the vasa brevia of the stomach, the assumption cannot be avoided that the same process evident in the liver is present in the stomach, a thrombo-phlebitis and inflammation of the neighbouring parts of the inner lining membranes of the stomach, with necrosis and consequent erosion by gastric juice of the area so affected. Histologically the gastric ulcers show the ordinary appearance of acute ulcer with a few minute thrombi in the veins of the periphery which might be seen in ulcer from other causes.

The lungs bear out the view of the presence of a shower of emboli leading to haemorrhages. We know that minute emboli are not stopped by having to pass through a capillary system, and the minute anatomy of the lung shows a marked degree of arteritis of the pulmonary arteries, with obliteration of their lumina (Fig. 2). The spleen in this case is atrophic and shows in a marked degree fibrosis and absence of Malpighian bodies, with phlebitis of the venous channels (Fig. 3). Patches of intense inflammatory reaction are to be found here and there. The difference between this and the spleen of a control animal may be seen by reference to Fig. 4, where the fibrosis is not evident and the Malpighian bodies of normal aspect may be seen.

In conclusion, I submit that in this experimental animal an inflammation of the spleen with thrombo-phlebitis has given rise to infective emboli, evident in their effects in the stomach, producing ulcers and haemorrhage, in the liver and lungs producing haemorrhagic lesions, and that in splenic anaemia, and more rarely in acholuric jaundice, the gastric haemorrhage may be due in a proportion of cases to septic embolism and consequent inflammation of the branches of the vasa brevia.

DISCUSSION.

Mr. D. P. D. WILKIE (Edinburgh) believed that the type of ulcer described by Dr. Gibson was probably that due to retrograde venous embolism. Attention was first directed to this type by von Eiselsberg, who suggested that the haematemesis which occurred some days after abdominal operations in which portions of omentum had been ligated was due to the separation of a small portion of thrombus in an omental vein, the embolus thus produced being side-tracked into a gastric vein and arrested in the venous plexus of the gastric submucosa, causing there a zone of thrombosis, a devitalized portion of mucosa and thus an ulcer. Experimentally he himself had found that such a succession of events was possible, but in the human subject he had only met with two cases in which this appeared to be the cause of gastric ulceration. The cause of the ordinary peptic ulcer of the stomach and duodenum was now considered by most surgical pathologists to be due to arterial embolism, and the researches of Rosenow would indicate that streptococci borne by the blood stream from a primary focus in the teeth or tonsils were the causal organisms. Whilst he had failed in his efforts to confirm Rosenow's results experimentally he had repeatedly confirmed the presence of streptococci in such ulcers. The difficulty of isolating and growing on culture these strains of streptococci made the close co operation of surgeon and bacteriologist a necessity in this line of investigation.

THE BONE GRAFT.*

BY

MARCUS MAMOURIAN, F.R.C.S.ED.,

SURGEON TO THE DISTRICT INFIRMARY, ASHTON-UNDER-LYNE.

THE bone graft is now universally recognized as a most effective means of bone repair and the most important modern development of orthopaedic surgery. The subject has been taken up with great keenness and enthusiasm by many, both from its practical and experimental aspects, with the result that the literary output has attained formidable dimensions.

The question of the part played by the bone graft remains undetermined, and Ollier and Macewen may still be considered as leading counsel for the claims of the periosteum and bone respectively. Both sides believe in the survival and growth of the graft, differing only in their interpretation of the process of its development. In England, Groves and Wheeler, while supporting Macewen in theory, are Franco-American in practice, as they advocate whole-piece, autogenous, periosteum covered grafts and rigid fixation. The success of the "inlay" technique and the claims of Albee, McWilliams and others seemed to silence all opposition until Murphy advanced the view that the graft was "osteo-conductive," acting as a scaffolding.

In July, 1918, in a short paper contributed to the BRITISH MEDICAL JOURNAL, I expressed the opinion that all that the graft did was to supply the biochemical stimulus or irritant which had been abolished by trauma or infection, the new bone being formed by the diaphyseal ends, by periosteal and bony remains in the shaft zone, and, in the young, by epiphyseal lengthening, and I supported Murphy's contention that the graft becomes absorbed. I adhere to that opinion, which has been strengthened by my recent work, the radiographic record of which shall be submitted to you.

I do not intend to weary you with lengthy descriptions of various histological and experimental observations, as they are mostly inconclusive and often contradictory. Suffice it to say that they veer in the direction of proving that growth—whether from periosteum, cambium or bone—is mainly subperiosteal, the rest of the graft showing atrophic changes.

We must admit that when a piece of tibia is used as a graft, logically speaking, we cannot expect it to grow, either in length, thickness, or density, to a greater extent than the parent bone, especially when we bear in mind the precarious nature of its blood supply. But it does grow, so we are told, and it grows by virtue of Wolff's law, which conveniently also explains the absorption of a graft when implanted in a region where there has been no bone before. In every contribution on the bone graft Wolff's law is the pivotal argument. Wolff has laid down the law and the bone conforms! And what is this law? It is nothing else than the universal law of organic strengthening under

* A paper read in the Section of Surgery at the Annual Meeting of the British Medical Association held in Newcastle-on-Tyne, July, 1921.

CASE I.

FIG. 1.—Tuberculous disease of radius with mixed infection.

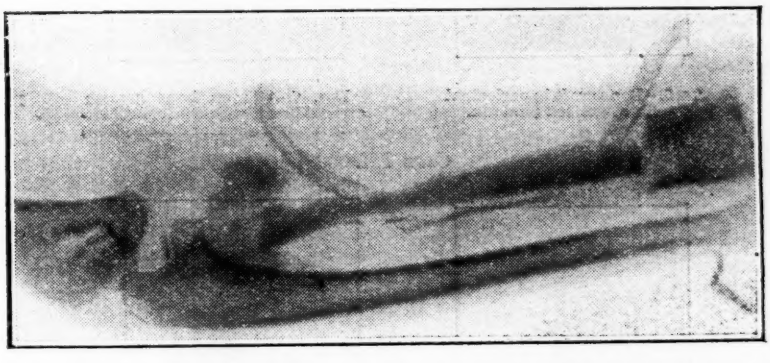


FIG. 2.—Shows bone graft in the space of excised portion of diaphysis; drainage tubes used owing to profuse suppuration.

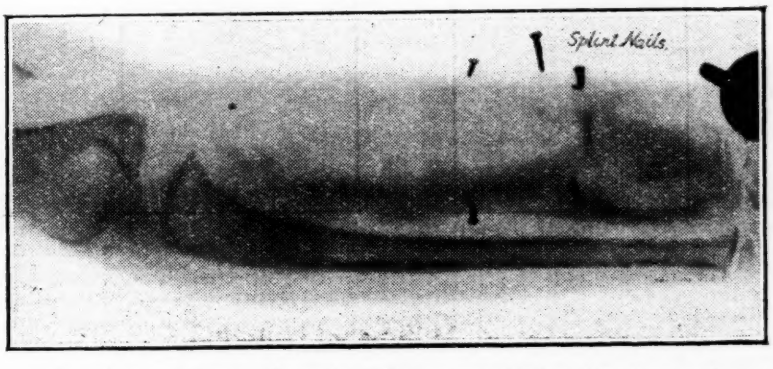


FIG. 3.—Shows active osteogenesis. Note loss of definition of the bone graft.

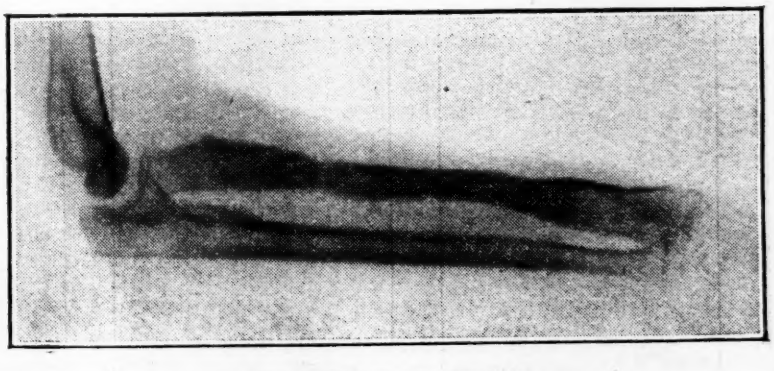


FIG. 4.—The completed radius.

CASE II.

FIG. 5.—Tuberculous disease of first phalanx of thumb.

FIG. 6.—Bone graft in periosteal sheath of excised phalanx.

FIG. 7.—Shows bone growth around graft, which is losing density in consequence of absorption.

FIG. 8.—The completed phalanx.

CASE III.

FIG. 9.—Whitlow of thumb, with necrosis of phalanges.

FIG. 10.—Bone graft equal in length to the excised phalanges *in situ*.

FIG. 11.—Note the vacuolation of bone graft and segmental reformation of the two phalanges (two months after operation).

FIG. 12.—Three months after operation. Disintegration of bone graft more marked.

CASE IV.

FIG. 13.—Myeloma of radius.

FIG. 14.—Tumour scraped out and transplant placed in cavity.

FIG. 15.—Invagination of bone graft by bone growth from shaft.

FIG. 16.—Commencing canalization of the reformed shaft.

stress and strain as seen in all plants, in muscle, and in bone. This is the law that is supposed to regulate the growth and shape of the bone graft.

The effect of stress and strain upon bone is undeniable. A fibula mobilized with its blood and trophic nerve supplies practically intact, and interposed between the epiphyses of a missing tibia, will thicken and in the course of many years may attain half the thickness of the missing bone. In speaking of the influence of Wolff's law we must retain therefore a sense of proportion. I am surprised that no one has attributed the shape and development of the bones of an embryo a few months old to intrauterine movements! The influence of this law is exaggerated, and the reasonings based thereon are unsound as far as the bone graft is concerned.

After a grafting operation a limb is immobilized for six, eight, twelve weeks or longer. We are all familiar with the condition known as disuse atrophy. A splinted limb wastes and there is wastage not only of the soft parts but actually of the bones, and Woodburn Morison of Manchester tells me that the degree of rarefaction and loss of density can be demonstrated by *x* rays. While the recipient bone is wasting in consequence of enforced rest, growth is claimed for the bone graft.

Albee, for instance, gives the following directions for after-treatment: (1) Place the limb in a position to relax displacing muscles; (2) immobilize the limb with plaster-of-Paris; (3) in desperate cases some support should be continued for three or four months. Obviously enough, his very directions are intended to abolish all stress and strain, and yet he speaks of firm unions and grafts acquiring the thickness of shafts in a few weeks' time. I do not question his results, but I question his interpretation.

Macewen pins his faith on the bone. His views may be summarized as follows: (1) Bone grows from bone; (2) the periosteum acts only as a limiting membrane. His famous case of the reconstructed humerus by the use of small homoplastic grafts is medical history. The patient was 2 years old. The epiphyses were not damaged. He considered the periosteum destroyed, planted his bones in the anatomical line, and attributed the formation of the new diaphysis to the growth and coalescence of his transplants.

I have had similar cases: flail limbs, soft limbs which showed no sign of bone formation for long periods, no vestige of bone in the line of the wound, but the radiographs revealed bone nests, numerous enough in some cases to indicate the alignment of the excised shaft. The absence of osteogenesis does not prove that the osteo-periosteal fabric is destroyed in its entirety—it never is—and should be considered as evidence of arrested or inhibited function. Furthermore, Macewen does not explain how he obtained limitation and growth to shape in the absence of a periosteal sheath.

The intramedullary graft has very few advocates nowadays. Here we have a transplant which can be applied with fairly easy technique according to the established canons: firm fixation, extensive bone contact, surface as well as medullary blood supply. Yet it fails, and fails because it induces pressure atrophy in the very shaft ends which are the main builders of the bony bridge, and because it obstructs the marrow from taking part in the osteogenetic process. Vacuolation and rarefaction can be seen around the penetrating segments. A non-rigid intramedullary graft (as the sliding graft in the femur) may succeed, a tight one never does. I am waiting for a satisfactory explanation from the Ollier-Macewen school of surgeons of the failure of the intramedullary graft.

Another noteworthy point is that sclerosed bone is not looked upon favourably for bone-grafting purposes. Thus Wheeler states: "In old and ununited fractures, with false joints, the bone near the critical area (near the seat of fracture) is sclerosed and avascular, and makes an unsuitable soil for that portion of the graft in contact with this area. Growth in the graft is impeded by the surrounding sclerosis, as dense sclerotic bone has no osteogenetic power." This statement is somewhat contradictory, as he expects growth both from the graft and the shaft end. If the graft were capable of a separate existence it should live even though its connexions with the diaphyseal ends were fibrous. But in my experience the sclerosed bone does respond, granted that the graft is not under pressure and growth in length is always from the proximal stump. Singularly enough, the same condensation of bone is seen at the attenuated end of the lengthened proximal segment.

The explanation is that on the introduction of a transplant two forces are evolved, acting simultaneously—the osteoblastic and the osteoclastic. If the former exceeds the latter in degree, the shaft is completed before the graft is absorbed, and, contrariwise, you may have the reconstructive process little advanced when the graft disappears from the field, the osteoclasts being the dominant force. As a rule, active osteogenesis is seen in the proximal and osteoclasis in the distal sector.

The appearance of callus on a broken graft has been hailed as proof of the survival of the graft. I look upon it as evidence of greater local stimulation. I may say at this juncture that I consider the periosteum as possessing stimulating properties of a high order, and I believe that before long the Delaginière technique will take the place of the exquisite joinery we are all disposed to practise at present.

There is no limit to the resourcefulness of the enthusiast, Albee's grafts always live and functionate, and when he discovers that his transplants of compact bone become cancellous in the spine, he sticks to his guns with some show of power, and his final salvo is the explanation that the bone graft is capable of histological as well as morphological adaptability. In Pott's disease the patient is splinted, but, more important still, there is intense muscular spasm of a reflex order; there is voluntary rigidity as a result of what may be termed kinephobia (fear of movement). The cry is for fixation, for compact bone. There is no physiological demand for this metaplasia. The cancellous bone originates from the spinous processes. Delbet, on the other hand, sees his graft unaltered in a cancellous environment. His peg of compact bone lives in the neck of the femur for years without change, as many a screw does. I still maintain that if a graft remains identifiable for six months or longer the case is one of necrobiosis.

Faith in the immortality of the graft has produced its corollary in the shape of a belief in its power to resist infection, and this has met with general acceptance. Everybody says it, but no one with less ambiguity than De Courcy Wheeler: "The bone graft has inherent bacteria-resisting properties." What is really meant is that a piece of bone in anatomical and physiological isolation is a bad culture medium. True, the graft does play its part in the presence of sepsis—not owing to its inherent bacteria-resisting properties, but because the concomitant infection is *per se* a stimulant to bone-forming structures.

A zone of new bone—an involucrum— is thrown out in almost every case of osteomyelitis, but this reaction is absent in tuberculous and neoplasmic diseases of bone, as these are not only purely destructive processes but actually osteo-depressant. The consolidation of a grafted ununited fracture in the presence of infection illustrates a type of union brought about by two stimulating agencies, the graft and the infection.

I agree with Heitz-Boyer and Scheikevitch that Texier's method of securing bony ankylosis by introducing mild infections into flail joints is a measure deserving of serious consideration in the treatment of these cases. But I go further, and I say that the cellular activity resulting from the implantation of a bone graft has a marked inhibitory effect on all infective processes, and to this I attribute the fact that throughout my experience with the bone graft, and particularly during the war—with infection lurking beneath every scar, with tissues devitalized by and studded with shrapnel—I have not lost a patient, I have not had to amputate a limb, nor have I seen a case of virulent infection, though medullary cavities and Haversian canals were gaping open, seemingly ready for any catastrophe. Encouraged by this lesson, I have never hesitated to insert grafts in the presence of mild and, recently, actually of acute infections. This is demonstrated in the radiograms.

Case 1 (Fig. 1) was a case of tubercu lous disease of the radius, with mixed infection; the skin was riddled with sinuses. In Fig. 2 the bone graft is shown in the space of the excised portion of the diaphysis; the excellent splinting effect of the transplant and the maintenance of correct alignment may be noted; scales of bone are still adherent to the periosteum, and there is a tuberculous cavity in the proximal diaphyseal stump. In Fig. 3 active osteogenesis

is demonstrated; the loss of definition of the bone graft should be noted. Fig. 4 shows the completed radius.

Case II (Fig. 5) was a case of tuberculous disease of the first phalanx of the thumb. Fig. 6 shows the bone graft in the periosteal sheath of the excised phalanx; it should be noted that the articular cartilages have not been interfered with. Fig. 7 shows bone growth round the graft, which is losing density in consequence of absorption. In Fig. 8 we have the completed phalanx.

Case III was a whitlow of the thumb with necrosis of the phalanges. In Fig. 9 there may be observed the enormous swelling of the soft parts owing to virulent suppuration and poulticing. Fig. 10 shows the bone graft, equal in length to the excised phalanges *in situ*. In Fig. 11 there should be noted the vacuolation of the bone-graft and segmental reformation of the two phalanges (two months after operation); suppuration has greatly diminished and the soft parts are acquiring a normal outline; there is good movement at the metacarpo-phalangeal joint. Fig. 12, three months after operation, shows disintegration of the bone-graft more marked; the thumb is almost normal in appearance, the sinuses have healed up, and there is improved movement at the metacarpo-phalangeal joint. This case is still under observation.

Case IV was a myeloma of the radius; in Fig. 13 the osseous outline of the growth may be noted. In Fig. 14 the tumour is scraped out and the transplant placed in the cavity; there is an "inlay" contact with the healthy end of the shaft. In Fig. 15 invagination of the bone graft by bone growth from the shaft is demonstrated; ossifying lamellae in the "egg-shell" cavity should be noted. In Fig. 16 is shown commencing canalization of the reformed shaft; it should be observed that bone of normal density occupies the space originally filled by the growth.

I am satisfied that the new bone and cellular life generally which result from the stimulating effect of the transplant are capable of overcoming pyogenic and tuberculous infections (Cases I, II, III) and of reviving normal osteogenesis in bones affected by neoplasmic formations of low malignancy (Case IV).

My thanks are due to Dr. Woodburn Morison of Manchester and Dr. Brice of Dukinfield for the radiograms.

GENERAL ANAESTHESIA AND THE ATMOSPHERE IN THE OPERATION THEATRE.

BY

J. ROSS MACKENZIE, M.D.,

ASSISTANT ANAESTHETIST, ROYAL INFIRMARY, AND TO THE ROYAL HOSPITAL FOR SICK CHILDREN, ABERDEEN;

AND

G. H. COLT, F.R.C.S.,

ASSISTANT SURGEON, ABERDEEN ROYAL INFIRMARY.

IN 1908[1] a note was published on the administration of ether by the open method in which the possibility of using a valved container was described, the valves being placed between the container and the face-piece. This was in the early days of "open" ether. Since that time the adoption of Hewitt's principle of using wide-bore tubes, which tends to abolish stimulation of the respiratory effort and so to lessen stridor and cyanosis, and the provision of a larger evaporating surface for the ether, have given us various pieces of apparatus for the same purpose. One of the best known of these is the Anson and Caldwell-Smith inhaler. Such an apparatus produces as good an anaesthesia as is obtained by the true open ether method, and at the same time considerably lessens the loss of the drug due to direct evaporation into the atmosphere. In any such piece of apparatus at first about 50 per cent., and, when anaesthetic equilibrium is established, 100 per cent. of the ether used is discharged into the theatre. In fact, at the present time it is not unusual for those engaged in operative work to be surrounded by unpleasant and deleterious vapours which would neither be tolerated nor permitted by law to exist in any ordinary factory. The chief sufferer is the anaesthetist, and next to him the surgeon and those in greater or less proximity to the patient's head. Some persons are more readily affected than others. As later results gastritis and anaemia are not unknown. In field work and in some cases where small rooms are used the effect on the staff is serious. This is notably the case when a flame, a glowing fire, or an electric heater is exposed to the vapour of chloroform, which is transformed into phosgene gas, and is one of the main reasons why operation theatres are heated by steam or water piping. In small and repeated doses this gas produces anaemia. In larger doses it leads to a feeling of tightness and constriction in the chest, most marked about twelve hours after the exposure, and followed by bronchitis of a varying degree of severity.

The "open" ether method, especially when combined with the use of narcotic and other drugs, is very safe, a fact which has undoubtedly had great weight in causing its almost universal adoption as an anaesthetic of choice for the great majority of operations.

We have thought for some years that it ought to be possible to generate the vapours outside the theatre entirely, to deliver them to the face-piece through a wide tube and to remove them by a similar channel, so that the atmosphere of the theatre need never be materially contaminated. One of us (G. H. C.) mentioned the point to an anaesthetist in 1907, but the matter did not materialize. We are not at present proposing to experiment in this way on any large scale, but we wish in this preliminary note to mention the chief points which seem to us important and which will undoubtedly require consideration in theatre construction in the future, as our trials demonstrate. In this way we hope to interest others who are conversant with the varied conditions existing in different parts of the country. It may be noted that the principle of removing the source of anaesthesia to a distance has been put into practice for some years past in cases in which a preliminary laryngotomy or tracheotomy is performed and the tube connected to a distant "tambour."

At the outset there will be a difference in plan according as to whether the operation is to be performed in an operation theatre or elsewhere. In the case of a theatre a permanent plant could be established just as illuminating gas is laid on. From the generator the tubes would be brought through the floor near the table, with taps, unions, and flexible connexions there, so that the apparatus suitable to the case could be connected to the main supply and exhaust. In some cases a single generating station might be arranged to supply to and exhaust from several theatres. But when the operation is to be done in a private house a portable apparatus would have to be employed and adapted on arrival to the local conditions. This could be made a simple thing, as we propose to show.

In the second place, the source of ether vapour should not allow any loss to occur to the outside air, partly on the ground of expense and partly to avoid contaminating the atmosphere near the theatre, bearing in mind the ever-present risk of explosion from a spark from an electric motor or other cause. To ensure this it would be necessary to generate the vapour at some distance from the air entrance, and perhaps to put a valve stop and fine wire gauze mesh behind it. The strength of the vapour could be regulated by a tap or throttle or other contrivance controlled from the operation table.

Thirdly, there should be a heater for the vapour and a quick-movement thermometer in the face-piece to show the temperature at which the anaesthetic vapours reach the patient. The face-piece itself would comprise an inlet and an outlet valve, but these might be provided for elsewhere and at a distance if found more convenient and if the CO_2 content of the system were not too great. In case any friction should arise in the system it will be necessary to maintain an exhaust at the exit of the fairway of such a degree that the valves would act with the minimum of differential pressure, and so that there would be hardly any deviation from atmospheric pressure inside the face-piece.

Fourthly, it will be necessary to arrange for the delivery to the fairway of nitrous oxide, ethyl chloride, chloroform, oxygen, or other agent as required, and the apparatus should preferably be adaptable to intratracheal methods.

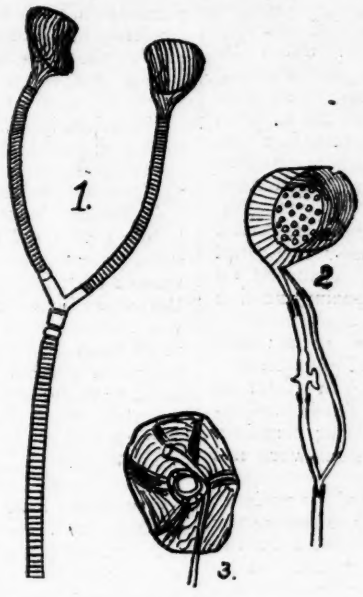
Lastly, the expired vapours should be trapped in a suitable solvent from which the chief ingredients could be recovered by distillation or otherwise.

It seems to us that this proposal is the ideal that will have to be taken into account in the future in the construction of any operation theatre, and that its adaptation to existing theatres will only be a matter of time. There is little doubt that the initial outlay would soon be wiped out by the saving of the cost of the drugs recovered.

The present system of ventilation in theatres is often imperfect, neither does it deal with the source of origin of the trouble.

In order to test some of the principles involved in our proposal we have carried out the following trials:

(*a*) Messrs. Down Bros. constructed for us the apparatus shown in Fig. 1. The point was whether it would be possible to collect the major portion of the ether by maintaining an extraction current of air close to the patient's mouth. The two cups are stream-lined and lie on each side of the mouth under the gauze used for open ether. The amount of ether vapour caught in this way appears to be negligible, as judged by the smell.



(*b*) A coil like a gas-ring was placed under the gauze. The result was better.

(*c*) Fig. 2 is an illustration of a rough and ready apparatus made from tin and gas-piping. Around the rim, which fits the face, and which consists of a wider tube outside and a narrower one inside, there are two series of holes. One series opens outside the face-piece but inside the "cone," and one opens inside the face-piece. By plentifully covering the cone with wool the smell of ether was lessened, and by adding a small extraction gas-ring (Fig. 3) at the top and covering the top of the cone with sheet rubber, except for the central hole through which ether was dropped, the smell was still further reduced.

(*d*) Messrs. Down Bros. lent us their experimental model of the Anson and Caldwell-Smith inhaler, and to the exit valve we attached our suction apparatus. Unfortunately the combination proved unwieldy, but we were able to note that the chief loss of ether was from the vaporizing bag, and that it was steady and continuous, so that clearly the solution of the difficulty lay in having a closed system with valves. We were not able to command the use of a Kelly's apparatus, and in Rutherford's the bore of the tubes was too narrow for our purpose. Messrs. Down Bros. therefore made us an inhaler like Silk's, but without the shelf, and fitted it with inlet and outlet valves.

(*e*) The inlet valve of this apparatus was connected, as shown in Fig. 4, to an ether supply by means of a light flexible tube made of coiled aluminium wire and colotomy tubing. The exit valve was similarly connected to an ordinary rubber gas bag. The other end of this was led off by narrower tubing to a wash-bottle containing alcohol, and a steady stream of air was kept up through this by means of a filter pump. It will be seen that this is a simple system, fulfilling the essential conditions for open ether, but the system is a closed one, and the only vapour that escapes is from the lumen of the inlet tube of the ether bottle. By placing the inlet valve here instead of on the face-piece even this source of atmospheric contamination could be avoided, and if the capacity of the system were not too large there would be no objection to doing this. If it were so large, owing to the length of the connexions, that expired CO_2 became a factor, an additional valve could be introduced at the open end of the inlet pipe.

The trials with this system were very satisfactory. While anaesthesia was maintained there was not the least odour of ether in the neighbourhood of the patient. It was noted that the respirations were not so laboured as is sometimes the case with ordinary open ether, the degree of muscular relaxation was better, and the fatigue of operating, which in many cases seems to be due to the inhalation of ether, was notably absent. Fatigue in operating depends on several factors, and at least one-third, if not more, of the ease and facility of an operation depends on the success of the anaesthetic procedure.

The chief point about the use of the wash-bottle is that it traps the ether vapour and prevents it from being sent down the drain, where it is a source of danger. The alcohol evaporates also, and a better system would be to have a second wash-bottle of water in the exhaust circuit. In actual practice the total amount of ether let down the sink during one operation would probably not be dangerous, so that for use in a house it would not be necessary to employ a wash-bottle, but if it were it should be a single one, small and made of metal. The use of a wash-bottle necessitates a slightly stronger exhaust. Alternatively, by leading the filter pump exhaust outside the house, the use of the wash-bottle becomes unnecessary.

For use in private, or as a temporary measure in a theatre, we conceive that a relatively short but wide ether bottle would be led off to the right-hand side, or alternatively the chin end of the mask. The mask would be reduced in height as much as possible, as it is notable that the unwieldiness of anaesthetic apparatus depends directly on its height, and its capacity should be minimal to avoid the CO_2 factor. In preference it should contain a Ticehurst system[2] for the self-warming of the ether vapour, itself an enormous advance on current practice, and the expired air should leave through the left-hand side, or alternatively the forehead end, of the mask direct through an exit valve to the bag. The other end of the bag should be led off by tubing to a filter pump operated from the nearest sink or garden tap. Convenient tap unions are in common use for hose pipes, and this method has given us satisfaction provided a safety tape is attached from the union to the tap. We think that the filter pump should be made of metal. In permanent installations, and in cases where there are suitable conveniences, a motor driven air pump will replace the more simple arrangement.

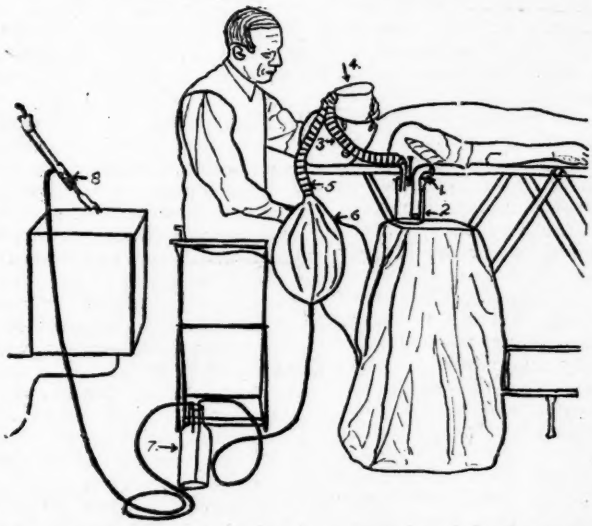


FIG. 4.—1, Air inlet; 2, ether supply; 3, flexible connexion to mask; 4, mask; 5, flexible connexion to bag; 6, equalizing bag; 7, wash-bottle; 8, filter pump with tap union.

The only serious difficulty that we foresee others will have is in providing for the use of an artificial airway. It might be possible to arrange a window in the lower portion of the mask and to make the join a sliding fit with a bead edging of leather to accommodate one of the patterns of airway in use.

The whole question is important at the present day and offers some degree of scope to those interested. There can be little doubt that a successful system would be a great boon to the anaesthetist, surgeon, and theatre staff generally. We are at present engaged on the details of a small portable apparatus.

REFERENCES.

[1] BRITISH MEDICAL JOURNAL, July 25th, 1908, p. 195. [2] Ibid., June 25th, 1921, p. 935.

DECAPSULATION OF THE KIDNEYS IN BRIGHT'S DISEASE.

BY

T. H. SANDERSON-WELLS, M.B.E., M.D.LOND., F.R.C.S.EDIN.,

SURGEON, WEYMOUTH AND DISTRICT HOSPITAL, WEYMOUTH.

IT is usually difficult to state when the first definite step towards any new procedure has taken place. Often the idea develops in the minds of more than one person acting from different points of view. It seems to me this has been the case with regard to decapsulation of the kidneys as a treatment for nephritis. The pioneers were Harrison, Edebohls, Israel, and Pousson, with many others, the two first mentioned apparently taking precedence. The history is as follows: The late Reginald Harrison in 1896 published in the *Lancet* three cases of acute nephritis cured by incision or puncture of the kidney for relief of tension. Later in the same year he contributed an article to the BRITISH MEDICAL JOURNAL proposing incision of the kidney for: (1) Acute nephritis with tenderness on pressure in the loins; (2) suppression of urine; and (3) for slow disappearance of casts. In 1901 he published in the BRITISH MEDICAL JOURNAL three cases in which he had incised the kidneys to relieve tension. These publications appeared to have attracted little notice; certainly they caused no great stir, and his suggestions were not generally followed.

Edebohls, in reviewing the clinical records of the patients on whom he had performed nephropexy by reflecting the caspule and stitching it to the lumbar muscles in the manner which is associated with his name, found that he had five times operated on patients suffering from chronic nephritis. He remarked that in three of these patients there was a "complete and permanent disappearance of albumin and casts," and "restoration to perfect and enduring health." Weighing this in his mind, he came across a sixth case in which both the kidneys were loose and the patient was suffering from chronic nephritis. On January 10th, 1898, he reflected the capsule and fixed the kidneys in this case, and claims that this was the first operation undertaken on the kidneys with the deliberate object of curing Bright's disease. In May of 1901 he went a step further and performed decapsulation, the kidney being in place, for the sole purpose of curing chronic nephritis, and later in the same year he published an article in the *New York Medical Record* reviewing 18 cases of chronic Bright's disease in which he had in the earlier cases reflected and later excised the capsule of the kidney, with the result that 8 of the patients were cured. He stated that after ten days there was an increased flow of urine.

It is interesting to note that these two authorities had a different object in view. Harrison incised or punctured the kidney for relief of tension, in the hope that it would lead to the absorption of the inflammatory products, allow the passage of urine down the tubules, restore the blood supply, and revive the tubular epithelium. The object of Edebohls was temporarily to relieve tension, but by bringing the kidney substance into contact with vascular tissue to increase its blood supply and allow a steady progress towards cure. They both agreed that the fibrous capsule formed an impassable barrier, one to expansion, the other to vascularization. These views were attacked on several grounds.

Physiologists pointed out: (1) That the renal arteries are end arteries and terminal; (2) that the blood supply from the capsule is insignificant; (3) that renal tissue once destroyed does not regenerate; and (4) that chronic nephritis is the local expression of a general disease, and a cure must remove the cause. Experiments were made on animals and the following results demonstrated: (1) That a new capsule was formed in a few weeks thicker and denser than the normal capsule; (2) that there were fewer vessels in the new than the old. Injections were made into (1) the renal arteries and (2) the aorta with the renal arteries tied. The general opinion as the result of these experiments was that there was but slight communication.

Stursburg, however, found on injecting into the aorta with the renal artery tied that the injection penetrated even to the papillae. Martini found new vessels in the new capsule and also that dogs survived an operation upon the renal vessels if the kidneys had been previously decapsulated, but died if this had not been done. Siter in 1913, in the *Journal of the American Association of Genito-Urinary Surgery*, gave results of experiments on cats and dogs. The kidney decapsulated and wrapped in omentum increased in size, new capsule formed immediately, new collateral circulation in ten days. This new collateral circulation, he held, was sufficient to allow the kidney to functionate when the renal vessels were tied. This many of his colleagues held to be impossible.

Pathological Reports.

Edebohls, in 1904, admitted the conflicting experimental evidence, but claimed that Dr. Larkin had demonstrated the existence of vascularization in two kidneys four months after decapsulation. Boyd and Beattie, in the *Edinburgh Medical Journal* in 1905, reported on the kidneys of a patient who died four months after decapsulation, and found the capsule vascular and containing vessels which appeared to anastomose with the vessels in the superficial part of the cortex of the kidney; they were, however, in doubt as to whether these vessels were more than those normally found between the renal and perirenal tissues ruptured by decapsulation. Gatti, in 1908, performed double decapsulation. The patient died twenty months later; the result of necropsy was that a capsule thicker than usual, with only a few blood vessels, was found. Boinet, in 1905, reported on the kidneys of a patient who died twenty-eight months after double decapsulation, that the new thick capsule was but little vascularized.

From the physiological and pathological standpoints the outlook therefore appears disappointing. From the clinical aspect, however, the result is quite different. Case after case is reported, mostly after months of exhaustive medical treatment of every description, including tappings after operations undertaken *in extremis*, in uraemia, eclampsia, suppression of urine, or when complet ly waterlogged, with astonishing results. The uraemic patient is restored to consciousness, the suppressed urine commences to flow, the oedema disappears. Patients apparently doomed have returned to work, many have subsequently passed an examination by the highest authorities and have been pronounced completely cured.

Edebohls, in his manual of the surgical treatment of Bright's disease, published in 1904, reports seventy-two cases. Seventeen are claimed as completely cured; many who were extremely ill were living in comparative health and comfort; nine cases operated on at death's door were alive and well. Sir Thomas Horder, in the BRITISH MEDICAL JOURNAL of November 13th, 1920, reports four cases with two cures demonstrated by most exhaustive examination, the other two being improved. He states his opinion as follows: "There is a clinical type of nephritis in which decapsulation becomes a definite indication and promises satisfactory results." Frank Kidd, in the BRITISH MEDICAL JOURNAL of March 12th, 1921, reports four cases, "one of which four years after operation appears to be perfectly well; the others improved in varying degree."

Crawford Burns, in the *Edinburgh Medical Journal* of September, 1916, reports a case, a female child, aged 6, operated on by Mr. Miles. She was oedematous; the vulvae distended; both kidneys were decapsulated at one operation. A fortnight after the operation urine became copious and dropsy disappeared. Operation was in February; she got up on March 25th and went home on April 8th, "lively and in good health." In the same journal of February, 1921, there are two cases published by Boyd: *Case 1:* A miner, aged 41, with swelling of the abdomen and legs, and oedema of lungs, was in a critical condition; operation was performed in January and the patient discharged on February 3rd. After a short time at home he returned to work; he has since worked uninterruptedly for three years. *Case 2:* A lad admitted for Bright's disease, later became uraemic with convulsions. When operated upon a fatal termination appeared imminent; five months later he enjoyed apparently good health.

Case.

The case I have to report is that of a man, aged 30, admitted to the Weymouth and District Hospital on September 24th, 1920. He had been on active service in the navy. Swelling of the feet and legs was first noticed in January, 1919. He was about that time in Haslar Hospital for five months.

On admission the legs and abdomen were swollen; he complained of weakness and shortness of breath. As regards the urine, specific gravity was 1020, the reaction was neutral, and it was full of albumin. The patient was treated during September and October on medical lines—jalap, diuretics of varying sorts, citrate and acetate of potash, diuretin, etc. Later he was given hot-air baths, pilocarpin in ⅓-grain doses. He had a vegetable and salt-free diet. Fluid was cut down to two pints and subsequently less daily. The urine varied between 30 to 45 ounces. With reference to the albumin, 3, 7, and 12 parts per 1,000 Esbach, with lesser variations, were recorded.

In November his condition was such that he could not lie down. His legs were enormously distended, his abdominal wall was oedematous, he had ascites and oedema of the lungs. On November 10th Southey's tubes were put into the right leg and 45 oz. were drained away; on November 13th tubes were put into the left leg and 147 oz. drained. On the 14th, 17th, and 20th other Southey's tubes were introduced and further drainage resulted.

As a result he improved. On November 22nd the note is: "Lung condition relieved, but dropsy still obstinate. Urine about 50 oz., albumin 12 parts Esbach per 1,000, but has been down to one-half part per 1,000. In December, 1920, he was given hot-air baths daily, and at intervals dry cupping to the loins. The diet was milk and vegetables. The urine had increased to from 40 oz. to 60 oz. On December 14th, 15th, and 16th the albumin was 8 parts per 1,000 Esbach, but has been down to one half part per 1,000. During January this treatment was continued and varying drugs were tried without any result. The oedema continued about the same. The patient could not lie down. Towards the end of January I saw him and made half a dozen incisions into his legs, which were then wrapped up in fomentations; 16 pints of fluid were quickly caught and this continued for some weeks. The dropsy diminished considerably, but by the end of January the note says: "Dropsy returned after the incisions had ceased draining; general condition much the same."

At this stage I proposed an operation to him, which he gladly accepted, and on April 29th I decapsulated the right kidney, which was very much enlarged, soft, friable, and pale in colour. At the end of the week his urine had risen to 62 oz. and the Esbach measurement was one-quarter part per 1,000. On May 15th the patient's general condition was much improved. The oedema had disappeared from the legs except the ankles, and completely from the arms. The legs were being massaged daily, and on the 28th the oedema had all gone from the legs, including the ankles. The legs were daily bandaged with soft crêpe bandages.

During this time I was away on my holiday, and on my return I found the patient walking about. With difficulty I persuaded him to have the left kidney decapsulated. Before consenting he went home, and returned for the operation on an arranged date free from all oedema, but with his urine loaded with albumin. I decided, however, to proceed, and the left kidney was treated in the same way as the right. On June 15th the urine was now clear to the Esbach test, but boiling showed the presence of a trace of albumin; the average amount of urine was 50 oz. daily. The patient subsequently left the hospital and returned home.

My attention was drawn to this procedure by an unusually sad case, an only child who was suffering from chronic nephritis. She was completely waterlogged, and the parents were anxious for anything possible to be done. I saw her several times in consultation with a friend and we decided against operation. After watching this case and studying the literature more thoroughly I now believe an operation would have been her best chance, as she died after a painful and prolonged struggle.

The published cases demonstrate that success is possible even *in extremis*, and some remarkably complete recoveries are recorded. Although the physiological and pathological findings are adverse, the clinical results prove that from the patient's point of view the outcome is often satisfactory. My patient is quite settled on this point. Moreover, he is probably characteristic of many in that, though not completely cured and possibly doomed eventually to die of the disease, the operation has been justified by the result.

The operation deserves consideration under two conditions:

1. As an emergency in eclampsia, uraemia, suppression of urine, etc. The more desperate the extremity the more certainly it should be discussed, and cases have been snatched from apparently impending dissolution.

2. In chronic cases, when medical treatment has failed after a thorough trial. In both the above classes the heart and arteries should be reasonably sound, which probably means that most success will be obtained in the first half of life.

DURING the last ten years the Japanese population in the United States has increased by 53.8 per cent., or more than all the other nationalities who have entered that country.

D

THE PASTEURIZATION OF THE MILK SUPPLY

BY

S. G. MOORE, M.D., D.P.H.,

MILROY LECTURER, 1916; MEDICAL OFFICER OF HEALTH HUDDERSFIELD.

LARGELY as the result of the persistent efforts of one of her citizens, New York has had a safe milk supply for the past five years. It is illegal there for milk to be sold for human consumption unless (*a*) it is from a herd of cows found by the tuberculin test to be free from tuberculosis; (*b*) contains less than 30,000 micro-organisms per cubic centimetre; and (*c*) is free from *Bacillus coli* in each of two samples=10 c.cm. each, or else *has been pasteurized*. Other milk may only be sold for commercial purposes, not directly to the public for food.

Milk may be classified thus: (1) Fresh pure raw milk: A living fluid, clean, free from tubercle bacilli and all other pathogenic organisms. (2) Pasteurized: The freshest and purest obtainable, heated to 145°–160° F. for twenty to thirty minutes in the same vessels in which it will be sealed and retailed. (3) Sterilized: Heated to boiling point for longer or shorter periods. (4) Dried: A form of milk in powder, obtained either by pouring ordinary milk over slowly revolving steam-heated cylinders or spraying it into a chamber against a current of hot dry air. (5) Last and worst, the form as vended among the public day by day.

The first grade is the ideal. It is scarce and costly; the total quantity available in England is insufficient for a single large town. Pasteurized milk offers the best prospect of a safe and satisfactory supply.

Sterilized milk is objected to from varying standpoints. Perhaps the fact that many persons dislike its cooked taste so much that they will not consume it is the most important. Again, it is alleged that infants fed on it develop scurvy, rickets, or Barlow's disease. These allegations are founded upon the conception that essential food factors are destroyed in the process of sterilization.

Dried milk has substantial advantages over ordinary milk in that it keeps indefinitely if properly stored, can readily be transported for long distances, can easily be stored, and is safe. The investigation carried out for the Minister of Health by Dr. Francis Coutts established that. On the other hand, the product does not permit of perfect reconstitution by the addition of water, however great may be the care exercised in the process. Not infrequently the butter fat appears in small globules rather than as cream. From time to time close examination reveals that the powder has a faint sub-rancid odour. On only one occasion during an experience of its use extending over twelve years has the writer found this condition so pronounced as to call for rejection of the supply. The makers readily and willingly replaced it, and expressed regret at the occurrence. It is costly. To some palates its taste is not agreeable. The "vitamin content" calls for investigation.

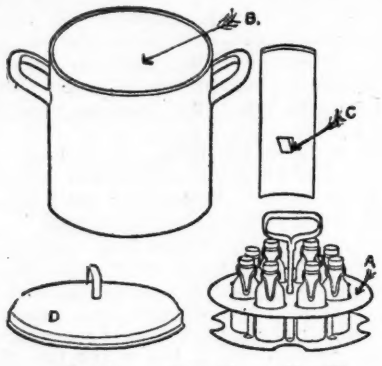
The process of pasteurization has made a place for itself in the United States of America which will repay careful examination. Reference has been made to the position in New York City. Similar statutes are in force in Chicago and in Cleveland, while in 95 per cent. of the cities of over 100,000 in the States pasteurization is approved and enjoined, though not enforced. The process calls for definition. A considerable proportion of milk sold in the ordinary way in large English cities is put through an operation called pasteurization, in order to delay souring, and so avoid the heavy losses entailed by milk becoming unmarketable, especially in hot weather.

There are various makes of apparatus on sale for this purpose, many originating in Denmark.* Milk flows through them in a continuous stream, entering at room temperature, passing through, or between, steam-heated coils, or chambers, and emerging at a temperature of 170° F. There need be no doubt that they adequately serve their purpose from the commercial point of view. But it is objectionable to call such apparatus "pasteurizers." The essential characteristic of the process devised by Pasteur to secure sterilization without alteration of essential

* A sample recently collected by the writer from such a machine, operated in good faith by a large co-operative society, gave a temperature of 170° F. at its point of emergence. It yielded abundant growth on culture.

properties of the fluids treated was the *maintenance* of a moderate temperature (145°–170° F.) for a sufficient period (twenty to thirty minutes). We would anticipate that milk treated by the "flash" method referred to above would either be like sterilized milk in its characteristics (if the temperature were high enough to render it free from micro-organisms) or, alternatively, would not be sterile.

In New York these methods are regarded as being ineffective imitations of a real safeguard. Properly pasteurized milk, such as has been distributed at less than cost from the Nathan Straus dépôts, is a satisfactory and safe supply. Mr. Nathan Straus devised a home pasteurizer, simple both to construct and to operate. It is not patented, and any tinsmith can readily construct it from the specification. There are no gauges to read. Only the proper quantity of boiling water applied for the indicated period is needed. Its effectiveness depends upon the specific heat of water in relationship with that of milk and to the respective quantities of each. The correctness of the calculations has been tested experimentally and verified by experience.



	Size I. Eight 3 oz. Bottles.	Size II. Eight 6 oz. Bottles.	Size III. Six 8 oz. Bottles.	Size IV. Six 16 oz. (pint) Bottles
Height of pan ...	10½ in.	10½ in.	12 in.	11⅝ in.
Diameter of pan	10½ in.	10½ in.	10⅝ in.	10¼ in.
Distance of top of bracket from bottom of pan	3 7/16 in.	4⅝ in.	4½ in.	6⅝ in.
Amount of water	5 quarts	6¾ quarts	7½ quarts	9 quarts

Directions for the Use of Milk Pasteurizer—System Nathan Straus.

1. Only use fresh filtered milk which has been kept cold, and proceed as follows:
2. Set the bottles, after they have been thoroughly cleaned, into the tray A, fill them to the neck, and put on the corks or patent stoppers.
3. The pot B is then placed on a wooden surface (table or floor) and filled to the three supports C (inside section, showing bracket for tray in the pot) with boiling water.
4. Place tray A, with the filled bottles, into the pot B, so that the bottom of the tray rests on the three supports, and put cover D on quickly.
5. After the bottles have been warmed up by the steam for five minutes remove the cover quickly, turn the tray so that it drops into the water. The cover is to be put on again immediately. This manipulation is to be made very quickly, so that as little steam as possible can escape. Thus it remains for twenty-five minutes.
6. Now take the tray out of the water and cool the kettles with cold water and ice as quickly as possible, and keep them at this low temperature till used.
7. Before use warm the milk—in the bottles—to blood heat. Never pour it into another vessel.
8. The milk must not be used for children later than twenty-four hours after pasteurization. Never use remnants.
9. The advantages of pasteurization over other systems, such as sterilization or boiling, consist in the lower degree of heat applied, which is sufficient to kill all noxious germs, while the nourishing quality and good taste of the milk are retained.

Pasteurization on the large scale calls for an equipment not readily described, nor understood, without the aid of complicated plans and diagrams. It is sufficient to say that milk after being placed in sterile receptacles is kept at the indicated temperature for twenty to thirty minutes by means of steam. The receptacles are then closed and sealed, refrigerated, packed in ice (in hot weather), and dispatched.

The experience of Mr. Nathan Straus extending over a period of twenty-eight years in New York, his continued and ever-increasing confidence therein, but above all the formal endorsement thereof by the municipality, justify the proposition that the pasteurization of milk supplies, with the exception of such as reaches the standard of "Grade 1, Certified," should be the immediate aim of all who are interested in public hygiene.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

ERYTHEMA SCARLATINIFORME.

DR. ANDERSON MURRAY'S memorandum in the BRITISH MEDICAL JOURNAL of November 12th (p. 796) raises an old question—namely, whether these cases of scarlatiniform rashes which follow septic wounds are not to be regarded as cases of scarlet fever, mild or severe, and hence whether they ought not to be isolated as such. Books vary in the significance their authors attach to "surgical scarlatina": Goodhart and Still, as well as Edmund Owen, pronounce the condition to be scarlet fever proper—with emphasis. The eighth edition of Osler's *Medicine* is more equivocal.

I have had three cases in the last twelve months similar to those mentioned by Dr. Murray. All three followed septic wounds of the type one has been taught to associate with streptococcus and which are seen often in erysipelas—that is, septic superficial wounds with a little thin pus and little or no surrounding local reaction. In one case, that of a little girl, there was a very intense rash with high temperature and vomiting; wholesale desquamation followed, and an axillary abscess; the original wound was on the hand. In the second case, of a lady aged 60, there was a small septic crack between the toes which gave rise first to lymphangitis up the leg and later to the scarlatinal rash. Desquamation was slight in this case. The third case, of a little boy, showed a bright rash with a temperature of 100°F.; after sixty hours he was free from any symptoms and signs except the original wound. No case had any tonsillitis, but in all the palate shared the rash and the tongue was of the "strawberry" type.

Now, scarlet fever is associated with the streptococcus, and the question arises: "When does a streptococcal case become infective for scarlet fever?" I do not think many would wish to dogmatize on such a point, but I submit that, once a septic focus—tonsil, middle ear, or wound—has given rise to a scarlatiniform rash, there is ample justification for regarding the patient as infectious for scarlet fever, and he should be isolated until the septic focus is no longer septic, and until any desquamation has ceased. The absence of septic tonsillitis is no diagnostic criterion; scarlet fever usually includes septic tonsillitis, probably because it is from the tonsils that the infection commonly becomes generalized; when, however, the generalization comes from a wound I would not expect a tonsillitis.

The severity of scarlet fever is said to have been reduced very greatly of late years by efficient isolation of mild cases, and I believe that in surgical cases of this kind all terms such as "septic rashes" and "erythema scarlatiniforme" would be better abolished, the cases being isolated and treated as scarlet fever until all signs of possible infectivity have ceased. I am encouraged to express this opinion by the fact that others far more experienced than myself share it. On the other hand, I know that there is a large body of opinion in favour of less arbitrary distinctions in these cases. It is in the hope of eliciting further information born of experience that I venture to send these notes.

Broadstairs. MARTIN O. RAVEN.

INGUINAL HYSTEROCELE.

THE patient whose case is described below was a female infant ten weeks old, whose mother was a primipara; delivery was at full time and the confinement normal. The mother noticed a "rupture," and two days later (August 16th, 1921) brought the baby to the King Edward VII Hospital, Cardiff, on her doctor's advice.

On admission the infant was well nourished and in no apparent pain. Examination revealed an ovoid swelling, the size of a small plum, situated in the left inguinal region. On palpation this was found to be fluctuating, somewhat tense, containing a small round movable body, corresponding in size to the infant ovary. All attempts to reduce the swelling failed. A diagnosis of irreducible hernia of the left ovary was thereupon made, and immediate operation deemed advisable.

Operation.

This was performed by Mr. Geary Grant. The hernial sac was large, and, on being opened, was found to contain the left tube and ovary and the fundus of the uterus; very slight further traction produced the right tube and ovary; the neck of the sac was very constricted, rendering the return of its contents difficult. The redundant portion of the sac was then removed, and the opening closed with two interrupted catgut ligatures. The external oblique was sutured with a continuous catgut ligature and the skin with horsehair. The operation was completed in twenty minutes. Recovery was uninterrupted, and the infant was discharged from the hospital with the wound soundly healed.

The above case is one of interest, inasmuch as hernia of the uterus is somewhat of a rarity. Da Costa in his *Modern Surgery* (1915 edition) describes it as a surgical curiosity, and in 1905[1] only 37 cases had been reported. Hernia of the uterus is most often found in middle-aged women who have borne children. In half the reported cases it was associated with malformations and defects, for instance, uterus bicornis, bipartitus, absence of one ovary, or hermaphroditism. It is more often on the left side in inguinal hysterocele, and is usually irreducible. In 8 reported cases it was associated with pregnancy.

F. T. Andrews, of Chicago, has made the most complete collection of hernia of the female pelvic organs: 366 cases were investigated, and of these 46 showed a hernia of the tube alone, 80 of the tube and ovary, 176 of the ovary alone, 43 of the non-gravid uterus, and 30 of the pregnant uterus. In the 46 cases of hernia of the tube alone, 27 were inguinal, 14 femoral, and 2 obturator; in the remaining 3 the variety is not stated. The ages of the patients ranged from birth to 46 years.[1]

With regard to the etiology of inguinal hysterocele in infants, it seems reasonable to believe that the relative shallowness of the infant pelvis (compared with that of the adult) is an important factor, inasmuch as pelvic organs in the adult tend to become intra-abdominal in the infant and are therefore much more likely to be herniated. Mr. Geary Grant had previously operated on a case of double hernia of the ovary alone in a child of 4 years, and he diagnosed the present case prior to operation as a hernia of the ovary. I am much indebted to him for permission to publish the notes of this case.

C. C. R. DOWNING, M.R.C.S., L.R.C.P.,
House Surgeon, King Edward VII Hospital, Cardiff.

A CASE OF QUADRUPLET PREGNANCY.

ON Thursday, November 10th, just before midnight, I was sent for to a woman, aged 38, who had been married ten years, but had had no family; she had had a miscarriage at five months on January 31st of this year.

She complained of pains in the abdomen, and being pregnant thought that she was in labour. Her last menstrual period had ceased on June 21st, but on palpation I found the uterus as big as if it were at the full period of gestation. After questioning the patient with regard to her menstrual history, I came to the conclusion that, as I could palpate the parts of more than one foetus, I was dealing with a miscarriage of a twin pregnancy with hydramnios.

On vaginal examination the os was well dilated and a premature foetal head was presenting in the normal position. The pains went steadily on and the patient delivered herself of a male foetus. An examination was made and the second was found well in the vagina in the occipito-posterior position, and this was delivered with the next pain, also a male. With the next pain two feet of a third protruded from the vagina still in their bag of membranes, and on delivering this it was rapidly followed by the two feet of a fourth; both of these were also males.

On placing my hand on the uterus a violent contraction took place and expelled the placenta, which was about the size of an average full time placenta, and had all four umbilical cords inserted close to the centre. There was one chorion and four amniotic sacs. There was very little haemorrhage and not a great quantity of liquor amnii.

The patient, who is a small dark haired, fresh complexioned, bright woman, did not seem at all exhausted and said that she felt quite well enough to get up. She has made an uninterrupted recovery.

Walkden, near Manchester. HENRY BATESON, M.D.

[1] Keen: *Surgery*, vol. iv.

British Medical Association.

CLINICAL AND SCIENTIFIC PROCEEDINGS.

EAST YORK AND NORTH LINCOLN BRANCH.

A CLINICAL MEETING of the East Yorks Division was held in the board room of the Hull Royal Infirmary on November 11th, with Dr. H. L. EVANS in the chair, when Dr. F. C. EVE showed a series of interesting cases.

CASE I.

A case simulating cervical rib. A female, aged 28, ten days after a normal confinement had a sudden onset of pallor and coldness in the right hand, and also pain in the hand and ulnar forearm which had persisted ever since (six weeks). There was no swelling. Examination showed a very weak grip, wasted thenar and hypothenar muscles, slight patchy ulnar anaesthesia and a very small right radial and brachial pulse; the heart was normal. Although two *x*-ray photographs showed no cervical rib, mechanical pressure on the artery and lower brachial plexus seemed assured and operation was advised. Mr. Upcott found no cervical rib or fibrous band, and could only assume that the nerve and artery were stretched owing to a low origin relative to the first rib. He excised half an inch of the first rib to ease the situation. Two days later the right radial pulse was much better though not equal to the left, and the pain in the hand and forearm had disappeared. The ten-day interval at the onset excludes anaesthetic palsy, but is rather suggestive of thrombus formation; this, however, would not explain the nerve symptoms.

Mr. HAROLD UPCOTT, in commenting on this case, showed four specimens of cervical rib, and mentioned another case in which he had resected a portion of the first rib to relieve pressure on the brachial plexus. The diagnosis between cervical rib and first rib pressure could only be made by *x*-ray examination.

CASE II.

A case of injury to the left cervical sympathetic nerve and right lower brachial palsy by direct violence had the following history: A bag of meal weighing 14 st. fell 18 feet on to the neck of a strongly built, youngish man who was stooping slightly. He was able at once to walk 100 yards, bearing strongly to the left in spite of strong contra-pressure; he was not unconscious. No bruising or swelling appeared, but there was pain and weakness in the right fore-quarter. Examination a few days later showed: (1) Injury to the left cervical sympathetic nerve, evidenced by smaller palpebral angle, larger pupil, increased left facial sweating, and by pupil reaction to cocaine. The adrenaline eye test indicated a preganglionic lesion. (2) Injury to the right first thoracic nerve was evidenced by weak intrinsic muscles of the hand. The tentative diagnosis was a simultaneous injury to those two nerves at their emergence by a temporary forward subluxation of the spine at this level. Partial anaesthesia of the right thumb and index finger extending up that side of the arm was not explained. *X*-ray examinations were negative, and there was no muscular wasting. The case showed improvement after five weeks.

CASE III.

A case of disseminated sclerosis, improved by salvarsan, was that of a healthy young man with a negative Wassermann reaction. The onset of weakness in the legs was insidious; three years before. There was no obvious cause. Recently he became unable to walk. His reflexes showed a spastic paraplegia, and there was no pain or evidence of spinal pressure. The writing was much more shaky than before. Hence disseminated sclerosis was diagnosed, although nystagmus, intention tremor, and scanning speech were absent. Two weeks' rest in hospital did no good. Then six intravenous injections of N.A.B. (0.15 to 0.60 gram) made his legs much stronger. He could not walk yet. Two more injections are due.

CASE IV.

A case of melancholia, improved by thyroid extract, was that of a woman, aged 53, past the menopause, formerly bright and active, but now for six months silent, brooding and self-accusative. Thyroid was suggested by the full and unwrinkled condition of the forehead skin. Thyroid extract (gr. 3, t.d.s.) has made this and her general condition much more normal, though by no means cured.

Dr. EDMUND BARKER mentioned a case of neurasthenia associated with psoriasis which was treated with thyroid extract. The patient improved under this treatment, and the psoriasis disappeared.

Dr. E. S. SIMPSON gave statistics of cases of melancholia in the East Riding Asylum, where thyroid extract had been tried (20 grains thrice a day). Generally speaking, there was some improvement in adolescent and adult cases, but none after the climacteric.

CASE V.

A case of splenic leukaemia, in which the spleen was very large, contracted wonderfully after six *x*-ray exposures; but he

soon relapsed when his bronchitis appeared to become putrid, and he was now moribund. Besides the usual myelocytes, his blood showed 10 per cent. of leucoblasts and 3 per cent. of lymphoidocytes; this latter cell, regarded as the common ancestor of both red and white cells, was demonstrated from a slide and from sketches prepared with panoptic stain by Dr. Knyvett Gordon.

Reports of Societies.

THE ARSENOBENZOL TREATMENT OF SYPHILIS.

A DISCUSSION on the arsenobenzol treatment of syphilis took place at the meeting of the Medical Society of London on November 21st, under the presidency of Mr. JAMES BERRY.

Colonel L. W. HARRISON, who introduced the subject, confined his remarks to a comparison of the different arsenobenzol compounds and methods of administration, the toxic effects following upon such administration, and the extent to which arsenobenzol should be employed in the treatment of syphilis. He considered that the modern "606" was not nearly so effective therapeutically as the preparation first given out in 1910. The latter was certainly more toxic, but the elimination of this toxicity seemed to have been accompanied by some loss of therapeutic effect. The modern "606," however, was superior in efficacy to "914," and sodium salvarsan seemed to be between the two. Silver salvarsan was probably what it claimed to be, about twice as effective as "914" in similar doses, and he remarked on its effect upon the cerebro-spinal fluid in syphilis of the central nervous system. The method of administration influenced the therapeutic effect of all these substances, and he described some excellent results following from the subcutaneous use of sulfarsenol, which he would not recommend for intravenous injection. Given subcutaneously, it offered a hope of treating syphilis over long periods without fear of toxic effects.

The vasomotor symptoms which followed intravenous injections of these compounds seemed to depend upon the physical state of the solution when injected. He found "606" much more prone to cause vasomotor symptoms than "914," and silver salvarsan could almost always be relied on to upset the patient unless it was given fairly well diluted. Of the "914" class of preparations, those which dissolved with difficulty were more liable to upset the patient when given concentrated than the less soluble. Dermatitis as a toxic effect had become less frequent since the war, possibly because the average patient was now less exposed to climatic vicissitudes. If dermatitis was to be avoided, warning should be taken from small signs of intolerance. He did not agree with the injection of a dose of arsenobenzol week after week according to a set programme, without a careful scrutiny of the patient before each dose. Jaundice following salvarsan administration resembled in many respects the liver disturbance caused by trinitrotoluene poison; fatal jaundice had occurred in little groups resembling small epidemics, and this seemed to point to some adjuvant factor in causation. The subject was obscure, and he hoped that the biochemists would evolve a practical test of liver intolerance, or even a preventive treatment, so that as much arsenobenzol as was necessary to cure the syphilis could be given without fear of the hidden danger of serious hepatic disturbance later.

It was frequently held, said Colonel Harrison in conclusion, that arsenobenzol was useful for getting rid of symptoms, but that mercury was the remedy which cured, or that, after all, mercury was the only specific. Thus there had grown up a custom in this country of giving arsenobenzol and mercury to render the reaction negative and then continuing with intermittent mercurial treatment until the end of two years. The reliance placed on this continued treatment with mercury after the Wassermann reaction had become negative was not justified, in his opinion, and he believed that if mercury were our only remedy to-day, instead of treating cases for two years, we should be treating them for four or five. Nobody knew how much activity was hidden behind the veil of a negative Wassermann reaction; it might be considerable. One was not justified in thinking that when the Wassermann reaction had been rendered negative, mercury would complete the cure. If arsenobenzol were only a symptomatic remedy—that is, one which hid the symptoms without affecting the parasite—its use in the routine treatment of syphilis would be condemned. It would be similar to giving a pneumonia case strong sedatives to get rid of the cough, or a typhoid case astringents to stop the diarrhœa. Arsenobenzol preparations were the strongest specific remedy we possessed, and he upheld the principle of chronic intermittent administration, not of mercury only, but of mercury and arsenobenzol, throughout the whole period of treatment. He thought it not difficult to show that arsenobenzol was a specific rather than a symptomatic remedy, because it caused the spirochaete to disappear rapidly from the secretion of early lesions, and also rapidly converted the Wassermann reaction to negative. By these two criteria he thought it must be granted that the arsenobenzol was immensely more powerful than the mercury.

Experimental Work on Jaundice.

Professor H. MACLEAN referred to some experiments he had been carrying out on the combination of jaundice and toxic symptoms which were found, not so very frequently, on the exhibition of arsenobenzol. He had first of all to find a test with which it was possible to demonstrate liver defect, and after rejecting some which were not sufficiently delicate, he found the laevulose test answer the purpose admirably, for laevulose, unlike other sugars, did not cause a rise in the blood-sugar content, provided the liver was efficient, but if the liver was inefficient there was a rise at once. For the last two years he had been using this test for liver inefficiency, trying it in various cases of toxic jaundice, with very marked results. This led him to make investigations, not only in those cases where the toxic condition was well established, but in those where one single dose of arsenobenzol had been given, and it was a remarkable fact that in a number of these cases, if one took the test at a suitable time, there was definite evidence that the liver had been affected. The change was not very great, but it was sufficiently marked to indicate that the arsenobenzol compounds had a definite tendency to affect the liver even in very small doses; and this, combined with individual susceptibility, and perhaps with the results of syphilis itself, combined to produce those toxic symptoms of which Colonel Harrison had spoken. The test was frequently of value also in estimating the prognosis. It had happened, for instance, that a case in which the clinical symptoms were unfavourable showed by this test that the liver condition was not so grave, and such a patient did well; the converse also held good. Another curious point was that so many cases of catarrhal jaundice appeared to have been treated at some time in the past with one or other of these arsenobenzol compounds. It was quite difficult to get cases of catarrhal jaundice which had not been so treated.

Professor Maclean went on to ask whether, having ascertained that the liver was exceedingly liable to the deleterious action of these compounds, one could protect the liver in any way against this action. There was some evidence that the liver cells were much more likely to succumb to toxic effects when they did not contain much glycogen. Graham, in the United States, had found puppies exceedingly resistant to chloroform poisoning until he removed the glycogen, whereupon puppies of the same litter as those which had survived the chloroform for four or five hours lost all resistance and succumbed within ten minutes. If it was the case that the liver cells were much more likely to be poisoned when they did not contain much glycogen it did not seem justifiable to give treatment by arsenobenzol compounds to patients who might not have had food for some time before coming for treatment—who were in fact suffering from the effects of hunger. It was very possible that at the clinics patients might come up who were actually starving, and it might be well in such cases to give them 50 grams of a sugar such as glucose half an hour before injection. This would make toxic effects less likely to occur.

Toxic Effects following Administration.

Dr. J. W. MCNEE remarked that, among some 75,000 patients treated for syphilis at the centres in one year, only ten deaths were reported as being due to arseno-

benzol compounds, together with 77 cases of ill effects. The variety of these ill effects reported was considerable, but the total number was small. At the same time, these figures could not be taken as strictly accurate. Deaths might be reported as being due to acute yellow atrophy of the liver and other conditions, for to say on the death certificate that death was due to arsenobenzol was equivalent to saying that it was a case of syphilis. The speaker went on to deal particularly with dermatitis as a toxic effect following administration. In cases with dermatitis which ended fatally there were practically always other changes affecting the endothelium—blood changes, with haemorrhages in many situations, especially in the lungs. There could be little doubt that these haemorrhages in the lungs were the cause of the fatal issue in the majority of these cases, for in that haemorrhagic area a fatal bronchopneumonia might be set up.

At Johns Hopkins Hospital two cases of dermatitis were recorded as ending fatally from aplastic anaemia, which, it seemed, might be a rare complication of arsenobenzol treatment, both in cases with and without dermatitis. With regard to encephalitis haemorrhagica, he doubted whether the term was a correct one. There was no evidence of inflammatory change in the brain in these cases; the damage occurred to the endothelium of the small cerebral capillaries, resulting in haemorrhage of the brain, and thus the cases were not true encephalitis. As for the liver condition, he mentioned that in Germany many outbreaks of jaundice had occurred since the war began, and a whole series of inquiries had been reported recently in the periodicals. The writers were of opinion that jaundice, both in cases which had been treated with arsenobenzol and others which had not, was very much on the increase, owing to the deficient and ill-balanced nourishment which the German population received during the war. Jaundice and acute yellow atrophy were evidences of one and the same condition. The onset of acute yellow atrophy in cases of jaundice had been ascribed to an infection, but to the pathologist the condition of the liver in such cases was quite different from that of an infection by a micro-organism, and much more strongly resembled some general toxic picture.

Pathological Changes in the Liver.

Dr. R. L. MACKENZIE WALLIS described certain investigations which he had made on comparatively small pathological changes in the liver. The three tests he selected for this purpose were the laevulose tolerance test, the lipolytic activity of the blood serum, and the cholesterol blood content. The first of these had proved to be of much value. It showed that the greatest damage to the liver occurred three months after the last treatment with the arsenobenzol compounds. Many of these cases were followed up further, and it was found that six months afterwards the ingestion of laevulose was no longer followed by any rise in the blood sugar, or was followed by very much smaller rise than had taken place earlier. The injection of arsenobenzol compounds appeared to throw a considerable strain on the liver, which was felt most acutely three months afterwards. It was inadvisable to give a second course of injections three months after the last course, unless these tests had been applied. The toxic action seemed to be confined to the liver, and to produce changes in the nature of local necrosis in almost every case. If the liver was capable of doing so, and was given an opportunity, it recovered its functions fairly rapidly without untoward consequences. In view of the hepatic strain involved, it might be advisable to give arsenobenzol on an empty stomach, and to prescribe a light protein and carbohydrate diet on the day previous to injection and the day after.

Early and Late Syphilis.

Dr. HENRY MACCORMAC said that in estimating treatment it was important to divide the disease into the primary, secondary, and late stages. Very little could be done as regards the Wassermann reaction in the late stages of syphilis. The disease then could not be cured, though much could be done for the symptoms. In the primary and secondary phases it was different, and here the object in view was the cure of the disease as well as the prevention of infection. No very clear distinction could be drawn between primary and secondary cases, which were very much of the same nature from this point of view. The whole question turned on the date of infection, and, apart from this, it did not really matter very much what the clinical manifestations might be. Nor should any sharp line be drawn between primary syphilis with a negative Wassermann and primary syphilis with a positive. Syphilis should be divided into two classes: early infection, including both primary and secondary stages, and late infection. The action of salvarsan was compared by the speaker to the action of water on a fire, whereby the fire was reduced to a smoulder. The subsequent treatment of syphilis by mercury was capable of dealing with any spirochaetes that might have escaped the destructive powers of the salvarsan, and therefore he thought that the mercurial treatment should be followed up for two years, in the primary and secondary cases, after the salvarsan treatment had been discontinued. It was necessary to ensure the cure by means of the mercury as far as possible. The late cases presented a different problem; here the attempt must be simply to treat the symptoms, for the disease itself could not be cured. A short course of salvarsan and then a short course of mercury should be given, after which all treatment should be stopped, and the patient should be seen six months or possibly a year later to determine whether another course was required or not. The speaker produced charts and tables showing the considerable extent to which salvarsan was pushed in the treatment of the likely cases at the Middlesex Hospital.

Experimental Tests on the Compounds.

Dr. H. H. DALE agreed with Colonel Harrison that it was a pity that they could not definitely, by the test for the toxicity of these substances, exclude the possibility of those rather alarming and unpleasant vasomotor reactions. But he described the dilemma in which they stood: if the toxicity were lowered beyond a certain point, they were subject to complaints that the therapeutic efficiency had been unduly lowered also. From the experimental standpoint, the experiments being based on mice infected with a trypanosome, it appeared that silver salvarsan was the most efficacious of the compounds they had handled, next came the old "606," then sodium salvarsan, then the neosalvarsan, and, lastly, the substance called sulfarsenol.

With regard to the toxic effects themselves, he thought that there was a good deal of evidence to show that the vasomotor reaction was not in the main a true toxic action of salvarsan as such. It was one of a group of reactions which could be obtained from various substances when they fell rapidly out of solution in the blood. When this happened, certain insufficiently explored colloidal changes took place in the blood, giving to the blood temporarily a kind of toxicity, and producing the reaction which had become familiar as anaphylactic shock, though it had nothing to do with true anaphylaxis. The toxic action on the liver fell into a different category. This acute process was not known, so far as he was aware, as the effect of administering inorganic arsenic. On the other hand, there was a close similarity between the liver effects after a prolonged course of salvarsan and the cases of acute yellow atrophy of the liver from exposure to trinitrotoluene during the war. He thought there was a good deal of reason to suggest that in these cases of acute yellow atrophy they saw the most characteristic effect of the salvarsan molecule as a whole; it was not properly a case of arsenical poisoning, but of something due to the complex organic molecule itself.

The Toxicity of Salvarsan.

Sir WILLIAM WILLCOX believed that fatal cases following treatment with salvarsan were much more frequent than was commonly supposed. He had seen a considerable number himself, although they were not always recorded as such in the death certificate. The toxic effects of salvarsan were very comparable to those of tetrachlorethane and trinitrotoluene. He agreed that inorganic arsenic did not produce the intense liver effect called acute yellow atrophy. In his own firm opinion the cases of acute arsenical poisoning which were put down as cerebral in type were not due to the toxic effect of the arsenic at all, but were autointoxications, such as one got in the case of other poisons which destroyed the liver function and caused an accumulation of toxins. In salvarsan and similar poisonings, if the liver were examined in the early stages, it would be found that the liver cells

were swollen and engorged with fat. A certain number of cells died, there was necrosis, and the liver shrank. It used to be thought that the symptoms of salvarsan poisoning in acute cases were due to the effect of the poison on the brain. He thought he himself was the first to disprove that, because eight or nine years ago he examined several cases of salvarsan poisoning, both animal and human, and found no arsenic in the brain or spinal cord. The cerebral symptoms were not due to arsenic in the nerve tissue, but were indicative of true autointoxication. With regard to the secretion of salvarsan, he had worked it out on several cases, and found that after a dose of 0.6 gram of salvarsan one could readily detect arsenic in the urine up to about the twentieth day; therefore the effect was somewhat prolonged.

Colonel HARRISON, owing to the lateness of the hour, said a few words only in reply. He thought it necessary in the administration of arsenobenzol to introduce intervals, which he did after the third and fifth day. He could not agree with much that Dr. MacCormac had said, but Dr. MacCormac and he must fight it out in private.

SYPHILIS OF THE STOMACH.

DR. GUSTAVE MONOD'S "occasional lecture" at the Royal Society of Medicine on November 23rd was on syphilis of the stomach. Sir JOHN BLAND-SUTTON, president of the Society, was in the chair.

Dr. MONOD, who said that the subject of syphilis of the stomach was very much under discussion in France at the present time, gave copious references from French and German literature. He remarked that nearly all the literature was French, German, or American. In British textbooks the subject occupied a very small place; in the *System of Medicine* by Allbutt and Rolleston, for instance, it was given only half a page, and it had an even scantier reference in other standard works. With regard to the frequency of the condition, he confessed himself unable to give any figure, although he believed that the percentage of cases was higher than was commonly supposed. He mentioned various estimates, including one by a French authority, based upon some 7,000 cases of all kinds of stomach trouble, that there was syphilis of the stomach in one-third of 1 per cent.; the 7,000 cases included slight dyspepsias, and so forth. Seeing that syphilis might produce its lesions at either end of the alimentary canal, he did not see why the stomach should be regarded as exempt. He then went on to deal with the clinical features of gastric syphilis. In the secondary stage of syphilis the main feature indicating stomach trouble was dyspepsia; there was nothing very definite about syphilis of the stomach at that stage. In the tertiary stage, however, patients more strongly complained of dyspepsia which was not amenable to ordinary treatment or dieting, and here any one of four types of syphilitic stomach might be manifested. The first and most frequent of these was gastric ulcer, which had the characteristic of being apparently amenable to treatment and then tending to relapse. Next came the cancerous type. Here he told of a French peasant who, afflicted with cancer of the stomach for which his doctor could do nothing, visited a quack with a reputation for dealing with this trouble, and, sure enough, returned home with his symptoms cured. The quack, it appeared, employed only one method of treatment, and that was to put a large mercurial plaster on the stomach of his patients. The third type was stenosis, in which *x*-ray examination with bismuth proved to be so useful. Dr. Monod regarded all hour-glass stomachs as highly suspicious of syphilis, while a double stenosis, he thought, was the signature of syphilis almost beyond question. The last of the four clinical types was the small plastic stomach, suggestive of linitis, or what was described later by one of the speakers in the discussion as the "leather bottle"; this also, he thought, might be a syphilitic manifestation.

Hereditary syphilis seemed to react on the stomach very frequently, but in adults the stomach conditions might take any of the four types he had discussed in connexion with the tertiary stage of the acquired condition. It was very difficult from the clinical point of view to say whether a syphilitic stomach in an adult indicated hereditary or acquired syphilis. In infants, however, the case was different. Here there were two specific types—the gastric haemorrhage of the newborn, with congestion and ulceration of the mucosa, and another type in which frequent vomiting was the main feature.

After a reference to gastric crises in tabes, in some cases of which there was marked lesion of the stomach, Dr. Monod went on to speak of diagnosis, and recalled that he himself was a student in Paris under an old Scottish doctor, who earned for himself the nickname of "Gastro-syphilis" because he followed the teaching of the French masters to such an extent that in absolutely every stomach case he would turn round and ask, "Is it syphilis?" Dr. Monod urged that the possibility of syphilis should always be kept in mind. Chemical analysis did not yield much result, nor did he know of any recorded case of spirochaetes being found in the contents of the stomach. With regard to treatment, he said that, apart from surgical treatment, the old remedies appeared to be the best—mercury and iodide, especially iodide.

In the brief discussion Dr. J. W. MCNEE described one case of syphilitic stomach—the only case he had seen—in which the spirochaetes had actually been found in an area where the diseased process appeared to have been very acute. He had brought the specimen to the meeting for examination. All syphilis of the stomach rested upon the morphology of the spirochaete. Dr. A. F. HURST said that his own impression was that the disease must be extremely rare. He had been definitely on the look-out for it in every obscure gastric case for fifteen years, and he had had only two cases in which the condition might have been due to syphilis, and in these the obstruction and symptoms cleared up under antisyphilitic treatment. At the same time, he believed that there was such a thing as syphilis of the stomach, and that its existence should be remembered.

Mr. A. J. WALTON said that it was an important matter for them to determine whether this was a pathological curiosity or a condition relatively so frequent that they must always have the thought of it in their minds. In his own clinical experience the cases which might have been syphilitic were very rare, and he thought it was necessary to be on one's guard against accepting, without a definite pathological examination, an ulcer occurring in a known syphilitic as necessarily a syphilitic manifestation. Dr. H. M. TURNBULL said that the only real proof of a syphilitic ulcer was the presence of the spirochaete. He had not himself come across a case which might be accepted histologically as syphilis, though he was engaged at the moment on one doubtful specimen, the work on which was not yet completed.

GLYCOSURIA IN PREGNANCY.

AT a meeting of the Section of Obstetrics and Gynaecology of the Royal Society of Medicine on November 3rd, with Professor HENRY BRIGGS, president, in the chair, Dr. R. L. MACKENZIE WALLIS read a paper on glycosuria in pregnancy. He divided the cases into two groups—namely, the intermittent or transitory glycosurias and diabetes mellitus. The first group presented characters of particular interest; the investigation of the urine was confined largely to the question of the nature and amount of sugar present, the presence of lactose being always excluded, and it was often a matter of some difficulty to decide whether the reducing substance present was sugar or not. In collaboration with Dr. P. J. Bose a method had been elaborated of detecting and estimating sugar in the urine in both normal and abnormal amounts. This method depended upon the removal of all interfering substances by means of a solution of phosphotungstic acid, and the identification and estimation of the sugar present in the clear filtrate. By means of this test it was possible to determine the nature and amount of sugar present in normal urine, and in pregnant women it was possible by this method to determine variations in the amount of sugar in the urine. The blood sugar examination was done simultaneously, and used to determine the nature of the case as well as to watch the effects of the treatment in a severe case of glycosuria in pregnancy.

By plotting the curves together it was found that the glycosuria in pregnancy gave curves identical with those in hyperpituitarism. In this group cases of marked obesity, acromegaly and intermittent glycosuria could be included on the results of the sugar tolerance test, and this was a

point worthy of further investigation in view of the part played by the pituitary body during pregnancy. Observations showed that 500 grams of glucose could be tolerated without the occurrence of sugar in the urine, and in consequence this type of case was best treated by leaving it alone. Attempts to restrict the carbohydrates in the diet generally made the patient worse, and the appearance of acetone bodies in the urine was likely to be misleading in such circumstances. The results of investigation showed that the two types of glycosuria met with in pregnancy required to be clearly differentiated, since in one type no treatment was required, yet in the other type the greatest care in the dietary became necessary.

In the discussion that followed, Sir WILLIAM WILLCOX said he thought that in addition to excessive activity of the pituitary gland attention should be directed to the increased activity of the thyroid. He considered the carbohydrate tolerance in patients with diabetes mellitus the determining factor as to whether pregnancy should be allowed to continue or not. If below 20 grams, pregnancy should be terminated, but above 50 grams, with special care it might be allowed to continue.

Dr. GEORGE GRAHAM differed from Dr. Wallis only in his interpretation of the blood sugar curves. He regarded the glycosuria of pregnancy in the same light, and thought that the strain of pregnancy showed a temporary diminution of the sugar tolerance.

Dr. CAMMIDGE said that Dr. Mackenzie Wallis appeared to think that glucose and lactose were the only sugars met with in the urine in pregnancy. Analyses in cases he had seen during the last fifteen years showed that glucose was present in abnormal amount in only 52 per cent., while lactose alone was found in 22 per cent. In the remaining 26 per cent. the reducing substances were either laevulose or pseudo-laevulose. The latter cases did badly on ordinary diabetic treatment, but did well on an abundance of carbohydrate. The most difficult cases to treat satisfactorily were those with a mixture of glucose and pseudo-laevulose.

Mr. A. E. MORTIMER WOOLF exhibited a specimen of a uterus showing double ruptured interstitial ectopic pregnancy. He had performed a subtotal hysterectomy, and the patient made an uneventful recovery.

Dr. W. J. O'DONOVAN showed a specimen of a gold button contraceptor which had been introduced in New York some months previously. The instrument consisted of two diverging arms which lay within the uterine cavity, and were attached to the button close to the external os. It had given rise to irritation of the patient's vulva. Dr. ARTHUR GILES said he had found some time ago that these instruments were advertised as the latest cure for sterility. Mr. NORMAN HAIRE said they were in common use in America and Germany. He was informed that they did not prevent conception, but if conception did occur abortion followed, which was often septic. He considered them most dangerous.

Dr. G. CRANSTOUN read a short communication on cystic adenoma of the uterus, the cyst formed having filled the whole abdomen; panhysterectomy was decided upon. The formation of the huge cyst appeared to be due to central degeneration of the adenomyoma, which had distended the upper part.

DETERMINATION OF RESPIRATORY EXCHANGE.

AT a meeting of the Royal Medico-Chirurgical Society of Glasgow, on November 18th, Dr. G. B. FLEMING made a communication on "The practical application of the determination of the respiratory exchange in health and disease." He outlined what was meant by the respiratory exchange as studied by physiologists and pathologists and explained the principles of direct and indirect calorimetry. The latter method was that used by him in his observations, when he employed a closed circuit apparatus, connected with which was a movement recorder, as described by Benedict and Talbot. In order to fix a standard by which to gauge the metabolism the basal metabolism was determined. After much investigation, this had been fixed for adults at 28 calories per kilo per twenty-four hours, or 950 calories per square metre of body surface per twenty-four hours. The difficulty in the case of infants was very great, and the figures for very young children might not be strictly accurate, but were near enough for practical purposes. Tables were shown illustrating the basal metabolism at various ages and the influence of various factors upon this.

In considering the practical application of examination of the respiratory exchange Dr. Fleming referred to Cathcart's studies of food requirements in the recruit while in training, and then compared the caloric requirements of men engaged for eight hours a day in various industrial pursuits with the requirements of an active boy from one year old till the age of 15 years. The more arduous the occupation the higher the metabolism. In certain diseases careful studies had been made and some valuable facts ascertained. In diabetes mellitus the respiratory quotient was low, and this proved that in spite of a hyperglycaemia sugar could not be metabolized. It had been shown also in diabetes that the metabolism was carried on at an extravagant rate. Consequently as full a diet as possible should be given, other factors which might contraindicate this always being taken into consideration. In exophthalmic goitre the metabolism was carried on at an excessively high rate, while in myxoedema and cretinism the metabolism was very low. The thyroid internal secretion seemed to have the power of stimulating metabolism. In a cretin under Dr. Fleming's observation there was a basal metabolism of 378 calories per twenty-four hours before thyroid treatment; after eight days' treatment with thyroid extract its basal metabolism had risen to 482 calories per twenty-four hours.

Recently the speaker had been studying infantile atrophy on similar lines, and he outlined various conceptions as to the cause of this condition, explaining how he tested the hypothesis that the fats, although absorbed, might not be utilized. From the figures obtained it was proved that the atrophic child could burn fat. Diagrams were shown which appeared to prove that the metabolism was not carried on at an extravagant rate. In adjusting the figures it was found that the actual weight of the marasmic child, when used for the calculation, gave erroneous results, and that, up to a point, the calculated weight for age was the correct figure. This was accounted for by the fact that until 35 per cent. of expected weight had been lost the wastage was at the expense of metabolically inactive tissue, fat, and carbohydrate, but that below this figure there was actual tissue wastage. It also showed that infants should be given quantities of food suitable for their expected weight; that was, for their age rather than their actual weight. Reference was also made to observations of heat output in fever, and to the making good of loss by feeding.

In conclusion, Dr. Fleming claimed that the study of the respiratory exchange allowed us to prescribe a diet suitable for various forms of industrial or athletic activity, and to the varying requirements of the human organism from extreme youth to old age. In disease it had afforded us knowledge concerning the derangement of metabolism in diabetes, exophthalmic goitre, myxoedema, infantile atrophy, and fever, and no doubt further use of these methods would throw additional light on other morbid conditions.

In the discussion which followed, Professor CATHCART referred to the importance of the study of the respiratory exchange. In America the method had caught on, but unless it was well and thoroughly done it was not worth doing and was valueless. All the apparatus in use had flaws and some many flaws. Of the apparatus recently introduced for general clinical use most was of very little use and only of limited application. For accurate results methods like the closed circuit or gas analysis had to be used. Physiologists believed this study to be one of the most fundamental. It gave clues to changes taking place in the living organism and enabled us to learn more completely what was the normal and what abnormal. In Professor Cathcart's opinion the new methods would throw much light on many problems, but would not be adaptable to clinical use on a large scale.

Dr. LEONARD FINDLAY said he was glad that Dr. Fleming's work was being done in the department in which he was specially interested. Dr. Fleming came to that department at a time when the condition known as infantile atrophy specially interested them. From observations they had made they had come to certain conclusions as to the cause of the condition, which were shown to be wrong

by Dr. Fleming's observations. Dr. Fleming did experiments in a case of obliteration of the bile duct in which there was practically no metabolism of fat. In this condition the respiratory quotient was lowered by the fat, showing that free fat interfered with carbohydrate metabolism. In understanding questions of nutrition the study of the respiratory quotient was of very great value. Finkelstein taught that an infant should be fed according to expected weight and not according to actual weight, and Dr. Fleming's results showed that this was correct. No doubt other theories and other problems in nutrition would be helped by these studies.

Stovaine Anaesthesia.

Mr. JAMES TAYLOR, speaking on stovaine anaesthesia, described the method of giving stovaine and the care to be taken in its administration, limiting his account to his own experiences in something over 500 cases. He used only the heavy variety, and, while believing some of the other drugs were safer, he considered that none gave such a perfect muscular paralysis, and this was of great importance in abdominal cases. He always used stovaine and glucose, and all his injections were given in the lumbar region. He considered stovaine to be the most perfect method of blocking the afferent nerves and protecting the patient from shock—in other words, of obtaining anoci-association. A fall in blood pressure occurred just after the injection, and this was but rarely alarming.

In his opinion, operations which were associated with much shock could be more successfully performed under spinal anaesthesia than with any other anaesthetic. In ten disarticulations at the hip after intrathecal injection all the cases recovered except one, where the collapse, after a railway smash, was extreme. Another group of cases which supported his contention was 12 consecutive cases of Wertheim's operation without a death, in one of which the whole rectum, from the pelvic colon downwards, was also removed. Another group of cases where stovaine had definite advantages over general anaesthetics was intestinal obstruction where there is much abdominal distension. The abdominal muscles were so completely paralysed that the difficulty of closing the abdomen so often experienced was completely done away with, and, moreover, there was not the same tendency to paralysis of the involuntary muscle of the intestine.

Mr. Taylor then referred to several of the disadvantages of the method, such as the trouble of injection, which was usually slight, and the difficulty of getting, during the operation, the proper mental atmosphere; this, however, induced less strain on the operator than that experienced when the anaesthetist using the inhalation method was not highly skilled. In any case the administration of morphine and hyoscine sent the patient to sleep during the whole operation. The greatest objection to stovaine was the initial fall in blood pressure and apparent collapse. This might be overcome by injection of pituitrin or inhalation of a little ether. In elderly and feeble people and in those with serious renal disease, and those suffering from recent loss of blood or anaemia, the condition of the patient might become alarming. While realizing this it might often be worth while to take the risk. The duration of the anaesthesia was variable, and the higher up the site of the operation the shorter time it lasted. In the upper abdomen it lasted about half an hour, and about twice that in the lower abdomen. Fifteen minutes after the administration of stovaine and glucose no further extension upwards took place.

A MEETING of the West Kent Medico-Chirurgical Society was held on November 11th at the Miller General Hospital, Greenwich, when Mr. PAUL BERNARD ROTH read a paper on the "Treatment of fractures," illustrated by *x*-ray photographs and plates. He emphasized the importance in all injuries to bones and joints of having a radiogram taken in two planes, anterior and lateral; screening, he considered, was not sufficient. The treatment he advised for fracture of the clavicle was a fortnight in bed, flat on the back without a pillow. There was no resultant deformity in this method, while Sayer's method left a deformity and often produced paralysis of the hand. Tying the wrist to the opposite side of the neck was the way to treat most fractures of the upper extremity, and in Colles's fracture the wrist had to be kept flexed or the deformity reappeared. The less splinting there was in the treatment of fractures the better, and instead of ordinary massage gentle stroking from the distal end towards the body, as introduced by Lucas-Championnière, was successful in promoting normal function. In fractures of the femur the application of a plate and screws was the sure way of avoiding deformity.

Reviews.

THE MECHANISM OF LIFE.

THE first 150 pages of Professor JOHNSTONE's interesting book on *The Mechanism of Life*[1] consist of an excellent introduction to the general study of animal organization. Stress is rightly laid on the importance of looking at organisms as complete integrated units. But we must also remember that an individual apart from its environment is also an unreal abstraction. As would be expected from the title, prominence is given to the doctrine of energy in the treatment of the subject, and this is heartily to be approved of. Careful perusal detects very few errors, even in matters on which physiological knowledge is only of recent date. The account of the secretion of urine is scarcely up to the standard of the rest of the descriptions, while the view that food materials become part of the chemical structure of protoplasm before being burned up is held by few at the present time.

If any more general criticism of this part of the book is to be made, it is perhaps that a somewhat disproportionate space is taken up with the anatomy and physiology of the central nervous system. This is probably to be accounted for as necessary for the correct understanding of the more original pages which make up the rest of the work. Here we pass on from physiology to psychology and to philosophy, not to say metaphysics. Nevertheless, it is somewhat of a surprise to find no account of the "conditioned reflexes" of Pavlov, although they throw light on some of the difficult questions discussed. This omission is, however, excusable in view of the fact that meagre space, if any, is given to them in most physiological text-books. It is to be regretted that so detailed an account is usually given of the anatomy of nerve tracts, adequately described in other places, to the neglect of essential facts of their function.

The reviewer finds it difficult to express opinion on the philosophical part of the book. He feels sometimes uncertain whether his acquaintance with the language used suffices to enable him to grasp the meaning properly. So much of what has been written on questions of this kind is made more obscure by the use of words in what seem to be unusual senses or even in different senses at different times. One is inclined to wonder whether attempts are not made to make statements about matters for which our mental nature is not equipped. The author himself appears to be in some doubt as to this, for we read on p. 234, "But, again, it seems quite possible to hold that this question of the relativity of the life passage and the environmental nature passage is one that has no meaning." It is unfair, however, to take a statement away from its context, and perhaps some idea of the problems discussed may be given by a few critical remarks. Much is made of the apparent gradual failure of determinism when we follow the behaviour of animals from the amoeba up to man. Apart from the fact that no scientific treatment is possible unless we assume determinism, is it not as reasonable to hold that we do not yet know all the factors controlling the phenomena as to say that these phenomena are essentially indeterminate? Our author holds that the former position becomes dogmatism if we say that we should be able to predict the results if we knew all the factors. But since decision is at present impossible and may always remain so, it is equally dogmatic to affirm the latter as the true view. It is surely as philosophic to take either position so long as no interference with our scientific work is permitted. This is the danger from which the vitalist has to guard himself. Michael Foster is quoted as saying that periods of domination of mechanistic conceptions have been the most fertile; those of vitalistic views, sterile.

---

[1] *The Mechanism of Life in Relation to Modern Physical Theory.* By James Johnstone, D.Sc., Professor of Oceanography in the University of Liverpool. London: Edward Arnold and Co. 1921. (Demy 8vo, pp. 248; 55 figures. 15s. net.)

It is interesting to note that Professor Johnstone takes the view that consciousness is something that accompanies the physico-chemical processes in the brain, and that it has no part in the energy transformations. These would, he thinks, be the same whether consciousness were present or not. One may be inclined to feel some hesitation in accepting, as the essential concept of life, the retardation of the degradation of energy that occurs in living processes. Surely the frequent occurrence of free energy being seized, as it were, before its transformation to heat has been pointed out before as more or less characteristic of vital reactions. But it is not peculiar to these. It occurs also in some photochemical reactions and elsewhere.

But enough has been said to excite the interest of those who are attracted by thoughtful biological speculation. To them the book may be highly recommended.

W. M. BAYLISS.

AMBROISE PARE.

AMBROISE PARÉ five years before his death (in 1590) published his *Apologie et Traité contenant les voyages fait en divers lieux*, which constitutes his title to lasting fame. The book is a French classic, written in a racy style, in the vernacular of the time. It gives a sketch of interesting campaigns with many stories, both strange and gruesome, and exhibits Paré as a great exemplar of an army surgeon. Dr. PACKARD, in his *Life and Times of Ambroise Paré*,[2] has made an excellent translation, and has prefaced this by an account of Paré's life, which was set in the midst of a particularly attractive period of the history of France. Dr. Packard is a rather indiscriminating admirer. Paré is a great figure in the history of surgery, and, as often happens in such a case, achievements have been attributed to him which really belonged to other men, and he has been endowed with qualities he did not possess.

After his death, Paré's voluminous writings failed to maintain their interest; during the eighteenth century he was almost forgotten. With the nineteenth century his great successor, Larrey, referred to him; in 1812 Vimont received for an *Éloge* a prize given by the Medical Society of Bordeaux; in 1840 a statue by David d'Angers was erected in Laval, a town which had overgrown Paré's birthplace, the village of Bourg-Hersent. His memory was definitely revived by Malgaigne's edition of Paré's *Oeuvres*, to which in 1885 Le Paulmier made important additions from various archives. Mr. Stephen Paget's most interesting account of Ambroise Paré and his times appeared in 1897.

If we confine consideration to Paré's place in the history of surgery an explanation may be required of the opposition he met with in his lifetime from the Faculty of Medicine and the reasons for the subsequent neglect of his writing. Paré was a most extensive copyist from French and Italian surgeons who had written in Latin; he wrote in a diffuse vernacular, using instead of Greek and Latin derivatives strange words dragged in from the country dialects, which even as so used were exceedingly ill defined. It was a retrograde procedure, which the Faculty of Medicine was well justified in opposing; German and English surgeons imitated him with equally confusing consequences. In copying from his predecessors he did not, in many instances, select the best, and what is good is obscured by irrelevant stuff. His *Anatomie Universelle*, 1561, of which Malgaigne only knew of two extant copies, is taken from the *Fabrica* of Vesalius, along with many of the illustrations. His account of tumours seems to be copied from Tagault, who in turn had copied from Guy de Chauliac, as also from Dalechampe's translation of Paulus Aegineta. Introductions, many ideas and phrases, and also heads of chapters, follow closely on Philippe de Flessèle's work published in 1547. The accounts of wounds, injuries to the head, fractures and dislocations, present no advance upon those contained in Hippocrates and Celsus. His midwifery is derived ultimately from Soranos, but is intermingled with superstitions and old wives' tales. His treatise on monsters, terrestrial and marine, with illustrations of curious and imaginary creatures like the unicorn, is taken from the mediaeval Bestiaries, together with scraps from Aristotle. Gourmelen said that Paré had included things about generation, midwifery, and monsters to create interest for fear that his surgical writings would soon be forgotten. Paré replied that he had included such matters to bring to light the treasures of the ancients which should serve as posts of observation (*eschauguettes*) from which a wider view might be taken.

He had learnt from Da Vigo to pour boiling oil into wounds, but, the supply running out, he used a "digestive" composed of yolk of egg, oil of roses, and turpentine. Later he obtained, after much trouble, the recipe for a vulnerary, his ol. cattorum, or kitten oil, made by macerating two kittens or puppies in oil of lilies and adding worms from a rainwater tank. Later still he came to use chiefly turpentine and brandy, but he ignored the lead lotions and collyria so largely used in Roman times, as noted by Celsus and Dioscorides, and which were the best for wounds before the antiseptic period. He cited, as evidence that gunshot wounds were not poisoned, that soldiers stirred up gunpowder in water and drank it as a protective. Taking poisoning of a gunshot wound in a wider sense, it is arguable that boiling oil followed by a dose of opium was better as a primary treatment than the septic vulneraries adopted as alternatives.

In substituting the ligature for the cautery when amputating, he neither selected the best methods previously described, nor supplied pertinent reasons from authority. Bertapaglia in 1490 said that a bleeding artery or vein should be drawn forward with a hook, separated from surrounding tissue (*excarnare*) and tied with linen thread. A better and firmer way was to transfix the mouth of the vessel so separated by a needle carrying the ligature, which was then knotted on each side. Benivieni in 1506, when treating a monk who had cut off his penis, seized each bleeding vessel separately and applied a ligature. Paré's quotation from Hippocrates has reference to the use of the ligature in the treatment of fistula in ano. Celsus and Galen had in view a punctured wound of an artery, especially that occasioned in the temporal artery when performing arteriotomy, after which a ligature was applied on each side of the bleeding point and the artery divided between. Unfortunately Paré described a ligature *en masse* which, when applied in the course of amputating the arm, tended to include the nerve, and the suffering endured by Lord Nelson is a classical example of the result. When this was combined with a tight drawing of the skin over the stump by his crucial suture, the objections made by his opponents can be understood. More than two hundred years later, Larrey saw the evil effects of the tight crucial suture among the Saxon wounded in Dresden. Paré's ansa haemostatica for secondary haemorrhage, a deeply inserted square or mattress suture, knotted over a pledget of lint applied to the bleeding point, was better, but the particular authority he quoted (Galen) had stated that the ligature should be applied in the course of the artery, on the side nearer the heart.

As to his midwifery, Philomenos and Soranos had described podalic version on the living child; Paré only referred, with Celsus, to podalic version for the extraction of a dead foetus. He did not mention the rectification of a head presentation by cephalic version, the bimanual manipulation described in Hipprocrates. He denied the existence of the hymen, believed that the pubic symphysis separated, and he opposed Caesarean section on the living. Although Paré himself does not mention it, Guillemeau states that he had seen Paré perform dilatation of the cervix, accouchement forcé, and that Paré's own married daughter had been so delivered. The procedure, including the use of a three-bladed dilator (ἡ μήλη), is noted in Hippocrates. Paré does say that being called to a woman in labour he went away without delivering her—as he remarked, "leaving the matter to Nature and commending her to God."

A few original observations by Paré may be disinterred. In the treatise on distillations and embalming he noted of a suffocated infant who had breathed that the lungs were full of air. He followed Paracelsus in affirming the inheritance of syphilis, and apparently for the first time stated syphilis to be a cause of aneurysm. He was the first to mention fracture of the neck of the femur, under

[2] *Life and Times of Ambroise Paré (1510–1590).* With a new translation of his Apology and an Account of his Journeys in Divers Places. By F. R. Packard, M.D. New York: P. B. Hoeber. 1921. (Roy. 8vo, pp. 297; illustrated. 7.50 dols.)

the heading "De la fracture fait prés la jointre du dit os." He angered the physicians by going outside the province of a surgeon and writing about fevers. He had had special experience of bubonic plague, and he advised a surgeon who had to be isolated along with the plague patients to purify his body with an aromatic theriac and to wear a sachet over his heart containing the same in the form of a powder, for a protection against insects transmitting the plague. W. G. S.

MICROSCOPICAL METHODS.

PROFESSOR GATENBY has edited a new edition of LEE'S *Microtomist's Vade Mecum*.[3] The book is so well known as the standard work on microscopical technique that only the differences between this the latest (eighth) edition and its predecessors need be noted. Though Dr. Lee's original arrangement of the subject matter has been largely retained, the improvements are many. The various sections of the book have been thoroughly overhauled—and in some instances entirely rewritten—in the light of recent advances in microscopical technique. Nor is this all: two additional chapters from the Editor's pen, entitled "The cultivation of tissues *in vitro* and its technique," and "Agenda for students of micrometry," have been inserted, to the advantage of the reader.

The chapter on cytological methods has been entirely rewritten by Professor Gatenby. It is, in our opinion, the best summary of technique in this highly specialized subject as yet published in any language. The exposition is a model of clarity, while its value is enhanced by the excellent tables on the differentiation of the various elements of the cell by means of specific histochemical tests. The other sections are equally serviceable. Those that are of medical interest comprise two excellent chapters by Dr. da Fano on histological methods for use in the examination of the nervous system. They have the advantage of being thoroughly up to date and should be of genuine value to the neurologist. Excellent also is the section on the histochemical recognition of intracellular fat, from the pen of Dr. Cramer, while Professor Bayliss has contributed an admirable introductory chapter on the principles of staining. Finally, Dr. Drew's contribution on protozoological methods should be of value to the pathologist, though the arrangement of the subject matter is somewhat confusing in places. The group "Haematozoa," for instance, has no zoological significance and inevitably overlaps with the section entitled "Haemamoebae."

The book is surprisingly free from misprints for a manual of its size. But statements regarding the "fibrillar structure" of the cytoplasm, as on p. 301 (and elsewhere), should be revised in future editions in view of recent advances in our knowledge of the colloidal structure of protoplasm.

This new edition of the *Microtomist's Vade Mecum* should become a standard book of reference in all laboratories. Especially will pathologists and neuropathologists find it useful. We congratulate Professor Gatenby on the general excellence of the work, and his collaborators on the genuine merit of the special sections.

FRACTURES OF THE VERTEBRAE.

THE thesis written for the degree of M.D.Leyden by J. W. Loos,[4] on fractures of the vertebrae, contains a general account of the subject; he relates details of 52 cases observed by himself between 1912 and 1918, and has very thoroughly examined the literature. His collection of 558 cases shows that the vertebrae most commonly fractured are those of the lower cervical and lower thoracic and lumbar regions; fractures of the first eight thoracic vertebrae are comparatively rare. One of the patients fractured the fifth lumbar vertebra at the age of 21, and, as Maxwell records, the twelfth dorsal and first lumbar when he was over 60; another, a coachman, fractured all his dorsal vertebrae from the third to the eleventh. The list contains 25 cases in which the twelfth dorsal and first lumbar vertebrae were fractured together. In 182 out of 357 instances the fracture was complicated by compression of the spinal cord, and in 93 the fracture was confined to the laminae.

The treatment indicated varies with the site and extent of the fracture. In many cases immobilization in plaster, with or without reposition, is indicated; in others laminectomy is necessary, particularly when signs of pressure on the spinal cord make their appearance. Loos recommends that the bony injury and loss of bone to which the fracture and laminectomy give rise should be made good by the transplantation of bone taken from the tibia or scapula in patients under 40 years old. This should be done by use of the methods and special instruments advised by Halstead (1915) or Albee.

Tabulation of the final result in 375 cases shows that 10 patients recovered completely and 40 more almost completely, slight defects were left in 73 cases, gross defects (causing from 60 to 100 per cent. invalidity) in 113; 88 patients died as the result of the fracture; 9 of the 52 cases observed by Loos himself proved fatal. The thesis contains much practical advice, and may be warmly recommended to the attention of surgeons, any one of whom may have to deal with cases of vertebral fracture.

PROSTHETIC DENTISTRY.

IN writing his book on *Prosthetic Dentistry*[5] Mr. GABELL has dealt only with the needs and difficulties of the dentist at the chair-side, the technique of the workroom is entirely, and purposely, omitted. He begins with an interesting chapter on the indications for and against artificial teeth, whether plates or bridges, remarking that it is desirable that there should be enough teeth to provide the normal and timely physiological stimulus to gastric digestion, insisting on the paramount necessity of cleanliness of the artificial teeth, and condemning the great majority of bridges as uncleansable. The preparation of the mouth for artificial teeth involves the filling of carious teeth, extraction of roots, scaling, and the cure of "pyorrhoea." Mr. Gabell finds that the cure of neighbouring inflammatory conditions will usually remedy the hypersensitive palate that can endure no touch of a foreign body. Incidentally he suggests as a possible cause of *tours palatinus* the vacuum chambers commonly used to retain an upper denture, the inflammatory thickening to which they lead eventually becoming calcified.

In the author's discussion of the aesthetic desiderata of artificial teeth we find little support for the widespread view that the shape of the front teeth bears a direct relation to the shape of the face. Mr. Gabell, indeed, appears to admit its validity, but adds that only frequent observation will ever educate the dentist to select the right teeth. On the vexed question of flat *versus* long-cusped molar teeth as giving the better biting powers, Mr. Gabell has no difficulty in deciding in favour of the cusped teeth, but spoils his argument by a gross diagrammatic exaggeration of the drawback of the flat tooth (p. 142). In discussing the means of retention of dentures, suction discs are condemned as futile abominations. Certainly, if retention by what Mr. Gabell calls "surface tension" (a term we think he should have left to the scientist)—that is, the adhesion produced by a continuous viscous layer of mucus between plate and palate, for the attainment of which he gives useful and practical directions—can be achieved, we agree; but large numbers of discs are used, and many would be grateful if Mr. Gabell would produce a less abominable form of suction disc.

Mr. Gabell writes well and clearly, except at two points. We cannot picture to ourselves a gum surface forming "arcs of a circle with a common centre either in one direction only, or, worse still, in two directions" (p. 29); nor can we follow the description of the small plastic operation described on p. 31.

The book is of sterling worth, and should take its place as a standard work on the subject. Mr. Gabell is to be congratulated, and his teachers and colleagues of the Royal Dental Hospital, to whom the book is dedicated, may well be pleased at his graceful compliment.

---

[3] *The Microtomist's Vade Mecum: A Handbook of the Methods of Microscopic Anatomy.* By A. Bolles Lee, Hon. F.R.M.S. Edited by J. B. Gatenby, B.A., B.Sc., D.Phil.Oxon., D.Sc.Lond., F.R.M.S., with the collaboration of W. M. Bayliss, M.A., D.Sc.Oxon., F.R.S., F.R.M.S., C. da Fano, M.D., F.R.M.S., A. Drew, D.Sc.Lond., F.R.M.S., W. Cramer, Ph.D., D.Sc., M.R.C.S., F.R.M.S., and J. Thornton Carter, F.R.M.S., F.Z.S. Eighth edition. London: J. and A. Churchill. 1921. (Demy 8vo, pp. 601. 28s. net.)

[4] *Over Wervelfracturer.* By J. W. Loos. Leyden: E. Ijdo. 1921. (Cr. 4to, pp. 178.)

[5] *Prosthetic Dentistry.* By Douglas Gabell, L.R.C.P., M.R.C.S., L.D.S., Dental Surgeon, Royal Dental and Charing Cross Hospitals, Lecturer on Dental Mechanics to the University of London at the Royal Dental Hospital. London: Henry Frowde, and Hodder and Stoughton. 1921. (Demy 8vo, pp. 247; 58 figures. 12s. 6d. net.)

CHEMICAL DISINFECTION.

THE textbook of *Chemical Disinfection and Sterilization*,[6] by Dr. S. RIDEAL and Dr. E. K. RIDEAL, contains, in reasonable compass and attractively presented, a large amount of miscellaneous and out-of-the-way information about the killing of parasites of all sorts, that should be of service to a multitude of readers. For the benefit of those who wish to learn more the authors provide bibliographies at the end of each chapter. The first six chapters contain accounts of the disinfection of air, food, water, public disinfection, and personal disinfection, the latter dealing with the use of antiseptic ointments, dressings, and the like. Non-bacterial parasites, both animal and vegetable, and the preservation of wood against decay receive special consideration, and the authors throughout write in a practical spirit and with an obvious command of the literature dealing with the various topics they discuss. The next five chapters are given to the chemistry and physics of the substances or processes used in disinfection, and are full of interest to the chemist, the bacteriologist, and the laboratory worker.

The last chapter in the book deals with the methods of analysis and testing, and more particularly with the bacteriological methods of standardizing disinfectants. A full description of the Rideal-Walker test is given in this chapter; first devised in 1903, this standard method boasts an extensive literature of its own. The authors show that the killing of bacteria by antiseptics cannot be regarded as a simple chemical action regulated by the laws of mass action.

The subject treated in the volume is one the authors are particularly well fitted to deal with; their book may be warmly recommended to bacteriologists, medical officers of health, sanitation experts, and all who are interested in the practice of disinfection.

NOTES ON BOOKS.

THE edition of the *Medical Directory*[7] for 1922, the seventy-eighth annual issue, has just been published; it contains some fifty pages more than the edition for 1921. The increase may in part be accounted for by the growth of the number of names; this year the volume contains 45,586 names, or 660 more than in the edition for 1921. The number of names in the section for London is practically stationary and the increases in the rest of England and in Scotland are very small. In the Welsh section there are 20 more names than last year and in the Irish 62. In the section for practitioners resident abroad there are 409 more names, which is, perhaps, only what was to be expected; but it is rather surprising to find an increase of 121 in the number of names of officers serving in the Naval, Military, Indian, and Royal Air Force Medical Services. We have not attempted to analyse the list in order to ascertain the reason, but one explanation may be the retention of the names of a good many retired officers in this part of the *Directory*. A new feature is the publication of a list of the honorary secretaries of Local Medical and Panel Committees in England, Scotland, and Wales. We have not found a list of the medical officers employed in the Insurance Department of the Ministry of Health. The notes upon the principal British spas and climatic health resorts are retained, but the medico-legal notes have not been restored, an omission which some users of the *Directory* will regret. The value of this annual is too well known to the profession to make it necessary to say anything in its praise; its completeness and its remarkable accuracy are fully appreciated on all hands.

The title of *The Gateway to Health*[8] is taken from a letter addressed some years ago to its editor, Mr. C. E. HECHT, by Professor Irving Fisher, an American economist who used the phrase as a description of the human mouth. What the title covers in the present connexion is more difficult to state, despite the fact that Mr. Hecht has supplied a long introduction. This, however, is rather in the way of an indictment of the errors of British cookery, and of the relative national neglect of the teeth of the rising generation than an exposition of the purpose of the book and summary of its conclusions. We take it, however, that in essence the purpose of the book is to serve as propaganda for reform in the two directions indicated and to provide an account of the conference held at Manchester early last year under the auspices of the Food Education Society, a body which now represents the original National Food Reform Association. The subject of this conference was the prevention of diseases of the teeth, and, as our readers will remember, a great many well-known medical men and dental surgeons contributed papers, or took part in the discussions. Only about the middle third of the volume, however, is devoted to this particular topic; the rest is devoted to two long "leaflets" which it was proposed to issue before the conference in question, and to reprints of articles which have appeared in the general and professional press at various dates, either on the subject of the conference itself or in support of the general aims of the Food Education Society. The book will no doubt fulfil the purpose we have ventured to ascribe to its publishers. In some respects, however, it is not as easy reading as might perhaps be expected. Its editor has a talent for devising striking "headings" and "side headings" that would be envied by many newspaper sub-editors, and uses them with a frequency and aptness somewhat calculated to obscure the main theme of the scientific statements in course of perusal. This, however, does not detract from the usefulness of the book to those in search of suggestions for addresses on the subject.

The thirtieth edition of *The Annual Charities Register and Digest*[9] is a classified register of charities that is indispensable for all those who are engaged in charitable work of any sort, particularly in the metropolis. It gives details of all the institutions, societies, and bodies that can be appealed to for relief in all kinds of affliction or distress, temporary or permanent. Beginning with a review of the finance of these institutions for the year 1919, so far as information is available, it goes on to give a brief account of the Charity Organization Society; the main bulk of the volume is devoted to a classified list of the many thousand associations or establishments that can afford relief. The book is supplied with an unusually good index and should be in the hands of all charitable workers.

Professor MATTOLI'S[10] essay on the surgery of the colon is a report presented at the twenty-seventh Congress of the Italian Surgical Society. It contains descriptions and discussions of ten operations on the colon, together with a tabulation of sixty-four operations performed by the author and a general discussion of these cases.

Professor LAUBENHEIMER'S[11] handbook of microphotography is designed for the use of men of science and amateurs alike, though somewhat stiff reading for the latter. It begins with a rather mathematical account of the microscope and its accessories. Then follow chapters on the camera and its use, on the varieties of light that may be employed, on the preparation of objects to be microphotographed, and on the details of producing negative and then positive pictures. The last chapter deals with photography in natural colours, using Lumière's autochrome plates. The book is practical, though overweighted with scientific matter that should be confined to manuals of optics. It may be recommended to the consideration of microphotographers.

The fifth edition of FRÄNKEL'S[12] large volume on the synthesis of drugs is a book for chemists, pharmacists, and physiologists interested in the artificial production of drugs, their fate in the body, and in the relations that can be traced between chemical structure on the one hand and physiological action on the other. The book contains a great deal of chemical information, and is provided with excellent indexes.

---

[6] *Chemical Disinfection and Sterilization.* By S. Rideal, D.Sc.Lond., and E. K. Rideal, D.Sc.Lond., M.A.Camb. London: E. Arnold. 1921. (Demy 8vo, pp. 319. 21s. net.)

[7] London: J. and A. Churchill. 1922. 36s.

[8] *The Gateway to Health: Prevention of Diseases of the Teeth.* Edited by C. E. Hecht, M.A. London: Published for the Food Education Society by the St. Catherine Press. 1921. (Demy 8vo, pp. 442. 12s. 6d. net.)

[9] *The Annual Charities Register and Digest.* Thirtieth edition. London: Longmans, Green, and Co., and the Charity Organization Society. 1921. (Demy 8vo, pp. 574. 7s. 6d. net.)

[10] *La Chirurgia del Colon.* Dott. Prof. A. Mattoli. Roma: Stabilimento Poligrafico per l'Amministrazione della Guerra. 1920. (Med. 8vo, pp. 137.)

[11] *Lehrbuch der Mikrophotographie.* Von Dr. med. K. Laubenheimer. Berlin and Vienna: Urban and Schwarzenberg. 1920. (Double cr. 8vo, pp. 228; 6 plates, 116 figures. M.72: bound, M.100.)

[12] *Die Arzneimittel-Synthese.* Von Dr. S. Fränkel. Fifth edition. Berlin: J. Springer. 1921. (Sup. roy. 8vo, pp. 913, M. 276; bound, M.306.)

ANTHRAX PROTECTION.

[With Special Plate.]

STATION FOR THE DISINFECTION OF WOOL AND HAIR AT LIVERPOOL.

WE referred in the JOURNAL of November 9th, 1918, to the report of the Departmental Committee appointed by the Home Office to inquire into the whole question of anthrax in industries using wool and hair. The Committee recommended the immediate establishment of a small trial disinfecting station in Great Britain to carry out the method recommended. The station is now erected and has commenced operations. The site is about 340 ft. long and 65 ft. wide, on land adjoining the existing wool warehouses of the Mersey Docks and Harbour Board at Liverpool. It has been decided to commence with the disinfection of East India goat-hair and Egyptian wool and hair.

Provision is made in the station for (1) warehousing material, (2) disinfection, (3) rebaling, and (4) recovery of grease. The principle of the process of disinfection worked out is first to place the possibly infected material under conditions in which not only is the natural protection of the anthrax spores removed, but the spores themselves also become susceptible to the destructive effect of certain disinfectants. The material then passes into the second or disinfecting stage of the treatment in which the organisms are destroyed with comparative ease. In the practical application of this process the material is submitted first to the action of an alkaline solution of soap maintained at a temperature of 102° F. for 30 minutes in three stages of 10 minutes each; and secondly, in the disinfecting treatment, to the action of a 2 to 2½ per cent. solution of formaldehyde, also at 102° F., for 20 minutes in two stages of 10 minutes each. It is then dried, cooled, and rebaled.

Though not actually a wool-washing process, the preliminary treatment is of such a character as to enable the material to be washed clean without much additional expense, and it is proposed to utilize it for this purpose, so that disinfected material will be freed from all dirt and foreign matters.

The photographs (see Special Plate), reproduced by courtesy of the Director of H.M. Office of Works (which has built the station) illustrate the disinfecting process. Fig. 1 shows the radial hoist for lifting the bales on to the travelling platform of a specially devised automatic feeding machine, which delivers the wool or hair into the disinfecting machines, the feeding mechanism being enclosed and provided with an exhaust fan in order to prevent dissemination of dust. The dust removed by the fan is delivered into the boiler furnaces through a device automatically controlled in such a way as to divert the air into the base of the chimney stack, should the furnace doors be opened or the boiler dampers closed. The disinfecting plant consists of five baths, each 33 ft. long and 4 ft. wide, which are fitted with squeezing rollers and mechanism of the harrow type for causing the material to pass through the liquids. The first three baths are used for the preliminary treatment, and incidentally for washing the material, and contain a slightly alkaline solution of soap and water. The last two of the five baths (Fig. 2) are used for disinfection; they contain a 2½ per cent. solution of formaldehyde. In order to prevent escape of formaldehyde vapour the two baths, including the mechanism, are entirely enclosed by airtight glazed covers or hoods. When it is necessary to empty the baths or purify the disinfecting solution, the latter is run by gravity into storage tanks, from which it can be pumped back to the machines, connecting pipes being so arranged that all displaced air passes from the tanks to the machines and vice versa.

The strength of the solution must be maintained by the addition of strong formaldehyde at intervals. In order to do this the machines are provided with a measuring device connected by pipes to a blowing egg arranged in connexion with a storage tank containing undiluted formaldehyde solution. When the requisite quantity of formaldehyde solution has been measured the shutting off of the supply automatically permits discharge of the compressed air from the blowing egg into the hood of the disinfecting machinery and the flow of more strong formaldehyde solution into the egg. The solution in the disinfecting baths is heated by means of exhaust steam passing from the steam engine through coils arranged on the bottom of the bath, below a false floor, along which the material travels.

The material passes from the disinfecting machine into an ordinary wool-drying machine (shown in Fig. 2), specially arranged to prevent the escape into the room of air conveying formaldehyde vapour, in which the material is dried in a current of hot air. From the drying machine it is automatically conveyed into a cooling machine, in which it is cooled in a current of cold air, so as to enable it to be rebaled immediately.

In order to guard against infection, overalls are provided for all workmen. A cubicle containing separate accommodation for overalls and ordinary clothing, and a hot and cold water shower bath is also provided for each workman, in addition to the hot and cold water lavatory accommodation.

The trial station is built to accommodate two units of disinfecting plant, each having an output of approximately 1,000 lb. of clean disinfected material per hour. The disinfecting station is to be self-supporting, a charge being levied on the materials disinfected to cover the cost.

The process is generally spoken of as the "Duckering" disinfecting process, adopting the name of Mr. G. Elmhirst Duckering, Secretary of the Anthrax Committee, who devised the process, and to whom its success is mainly due. He is now director of the station.

RESOLUTION OF INTERNATIONAL LABOUR CONFERENCE.

The disinfection of wool affected by anthrax spores was one of the subjects on the agenda at the International Labour Conference held in Geneva last month to consider a draft for a Convention proposed by the International Labour Office.

It very early became evident, however, that misconception existed not only as to the efficiency of the method of disinfection which had been worked out and the extent to which it had already been practised at the Liverpool Station, but also as to the kinds of wool to be subjected to the process. A quite erroneous idea was prevalent that all wool (even Australian and New Zealand) would require disinfection. Members of the Anthrax Commission, therefore, unanimously came to the conclusion that the question of compulsory disinfection of wool infected by anthrax had not yet been sufficiently studied to justify the adoption of the draft Convention. Instead, they recommended that the question of international action in this respect should be made the subject of further investigation and examination by an advisory committee.

The following resolution was unanimously carried in plenary session on November 14th:

> 1. This Conference, while recognizing the important advance made by the British Government towards a solution of the problem of satisfactory disinfection of wool and hair infected with anthrax, considers that the question of universal compulsory disinfection in its economic and humanitarian aspects has not yet been sufficiently studied to justify the conclusion of an international Convention.
>
> 2. This Conference therefore requests the governing body of the International Labour Office to appoint members representing the chief producing and manufacturing countries to serve on an advisory committee, which should be instructed to examine the question in all its bearings, and present a report to the governing body in time for consideration by the Conference in 1923, and is of opinion that meanwhile the proposal for an international Convention should be postponed. . . .
>
> 3. This Conference, while accepting disinfection as the only effective means at present available for protecting industrial workers against infection from certain classes of material, regards the eradication of the disease among animals as the ultimate solution of the problem, and is accordingly of opinion that the committee referred to in the second paragraph should be further instructed to make full and careful inquiries as to the most practical and effective methods of preventing infection, and to make a separate report for consideration by the 1923 session of the Conference.
>
> 4. This Conference wishes to place on record that the danger to workers of infection by anthrax from hides, skins, and other materials is also serious, and deserves careful study and investigation.

THE *Revista Médica de Chile* states that in 1920 7,939 cases of typhus fever were recorded in Chile, with a mortality of 19.90 per cent.; in Santiago alone there were 1,457 cases, with a mortality of 31.64 per cent.

MOTOR NOTES FOR MEDICAL MEN.

BY H. MASSAC BUIST.

THE MOTOR CYCLE SHOW.

THE seventh international show organized by the Cycle and Motor Cycle Manufacturers' and Traders' Union closes at Olympia, Kensington, on Saturday night. At the one extreme the exhibits embrace pedal bicycles and a few examples of motor scooters, and at the other, eight makes of cycle cars of the three-wheel type. What is, mechanically, the most important development under this head is, nevertheless, one that is not directly of interest to medical men—namely, the introduction by Morgan, the pioneer and the only firm of world-wide repute in connexion with the marketing of this class of machinery, of an 8-h.p. J.A.P. engined sports model, with somewhat shorter wheelbase than the standard type. The water-cooled T.B. tricar, with full cantilever rear springs, is the only other type of three-wheeler that has succeeded in climbing the Nailsworth Ladder. The 10-h.p. New Hudson has a water-cooled engine and is the type of machine that did notably well in the London-Edinburgh run, being well designed and finished. The Castle Three is also fitted with a water-cooled engine of the four-cylinder type, the bodywork being on the car principle with dickey seat. The fifth example of a three-wheeler make which has been previously introduced to the public is the Yorkshire built L.S.D., the improvements embodied in which include the use of a new "kick" starter and the fitting of better bodywork. The three other three-wheelers shown are new makes of no particular interest in their present stage to the medical profession—namely, the Day, the Economic, and the Xtra. The Scott Sociable also figures as a cycle car of the three-wheeled sort. It is built, however, on side-car lines.

Suspension and Accessibility.

In regard to motor cycles proper, perhaps the two most noteworthy developments of the year do not strictly concern doctors. I refer, on the one hand, to the use of engines of practically 1,000 c.cm. capacity, which is now one of the notable car types, as instance the 8-h.p. four-cylinder overhead valve engine Talbot capable of 55 m.p.h. introduced at the recent passenger car show; and, on the other, to a number of motor cycle sports models with engines of any capacity ranging from 300 c.cm. to 600 c.cm. These latter are sold with guarantees of speeds up to 75 and 80 miles an hour. Of course one litre machines bring 100 miles an hour within range of accomplishment in racing. But in the smaller categories we have very interesting work done by A. J. Stevens, of Wolverhampton, who won most of the blue ribbon events of the motor cycle world this year, including both tourist trophy races, the senior one with a machine of so small an engine size that it came within the junior category. The new A.J.S. types are rated at 2¾-h.p. and have side valve engines, the sports version being capable of speeds of a mile a minute. These mounts are interesting by reason of the application of the motor-car principle of braking, in that the back wheel has an internal expanding shoe pattern brake controlled by a pedal and the front wheel has the same type of brake controlled by Bowden wire lever. The front fork spring schemes on these motor bicycles are interesting. Suspension, indeed, has received attention by most designers, as instance the wide use of leaf springs. There are numerous examples of the furnishing of very deep valances to mudguards, as instance the Harley-Davidson. This was a development that began some years ago. An interesting variant, however, is furnished by the two-stroke 3-h.p. Omega with a wide type of pressed mudshield that permits of an extra draught impinging on the beehive type of cylinder used while, nevertheless, protecting the rider completely from mud no matter what the position in which the front wheel is turned for the purposes of steering the vehicle. On this machine, too, the new telescopic pattern fork fitted is immune from side play and is controlled by the action of a single-coil spring. The vertical rods act as oil reservoirs; buffer springs are fitted in the top of the side members; and the movement is in the same line as the steering head. Tyre changing is facilitated by the quickly detachable rear guard on the two-stroke, as well as on the twin-cylinder, Enfield models, wherein the carrier is supported at the lower end by two hexagon nuts disposed one on either side. By loosening them with a spanner the slotted ends of the stays can be lifted clear of the studs, and the curved forward end is released from the socketed lugs fixed to the back stays. Carrier and mudguard complete can then be lifted forward, leaving the rear tyre accessible for repairs.

An unusual feature is furnished on the twin-cylinder Zenith model with Bradshaw engine, wherein the space between the upper surface of the power plant and the under surface of the fuel tank is used to accommodate a silencer specially designed to ensure safety as well as coolness, so that under all conditions of service the rider can place a bare hand on it without discomfort.

Some Light-weight Types.

Chater Lea introduces a two-speed 2½-h.p. light-weight model at 50 guineas, which is little more than the pre-war price, yet the quality and finish are up to this firm's high standard. Raleigh makes two interesting contributions to the light-weight category, the larger being rated at 3 h.p. and capable of employment with a light side-car. The lesser is a solo mount of 2¾-h.p. rating. The crankshaft used for the single cylinder power unit employed in each case is in one piece, balance weights being bolted to it. The big end bearing is a split bronze bush. New Imperial introduces a light-weight with loop frame, the engine and gearbox being a unit assembly. The rear brake is of the internal expanding type, which is increasing in popularity. The 1922 P. and M., with forward inclined engine, has a new type of frame wherein, nevertheless, the power unit forms part of the frame member, the head anchorage being ingenious. The lubrication of the fork plunger as well as of the fork rocker details in this machine is on motor-car principles and in most accessible fashion. The two-stroke engine constitutes the down tube, the fuel tank the main member, and a stay the third member of the triangular frame on the Peters machine. A simplified frame is employed for the new 6-h.p. twin-cylinder B.S.A. model. A Barr and Stroud sleeve-valve type of engine is furnished to one of the new Beardmore-Precision models, while another model has a double purpose four-stroke 4¼-h.p. machine made by a firm hitherto concerned with two-stroke practice. A *de luxe* 2¾-h.p. New Hudson model has all-chain drive and upswept footboards and leg-shields. The new 4-h.p. Calthorpe solo mount shows evidence of attention to suspension details, and is so designed that it can be used, at option, with a side-car. The chief Triumph novelty is a 3½-h.p. single cylinder solo mount, with four overhead valves and light Ricardo aluminium slipper piston. The chief interest to medical men consists in this firm's well-proved products already on the market, a remark which also applies to the Humber and Rover exhibits, which embrace, incidentally, a 75 m.p.h. sporting model by the former firm and a 75/80 m.p.h. type by the latter. The range of Brough models is supplemented by a 3½-h.p. type, incorporating the firm's distinctive engine design with a cylinder built up of four parts—the barrel, the detachable head, and the two valve ports. The manner in which the wheelbase of this machine is kept short, despite the use of a horizontally opposed twin-cylinder engine, is ingenious.

Guarding the Rider.

At the recent Paris Motor Cycle Show there were some interesting examples of the use of pressings, notably by firms hitherto engaged in the aviation industry. There is not much evidence of this development at the present show in London; but in this connexion mention may be made of the Hagg, which can be used at option as a tandem mount, the passenger being accommodated in an aluminium bucket seat sliding in grooves attached to the valances of the pressed steel rear mudguard. In face of the evidences of striving after originality of construction on the part of Continental makers, it is interesting to note that the only non-freakish type that gets away from ordinary motor cycle practice at this show is of British origin, namely, the single cylinder Ner-a-Car, an example of which, ridden by a lady, has lately been put through a 1,000 miles road trial by the Auto Cycle Union. The makers

claim that this is the link between the car and the motor bicycle. But though it differs notably from general motor bicycle constructional practice, nevertheless it is essentially a motor bicycle. Considerable use is made of pressings. The very wide front mudguard does not move with the wheels, but is of ample width to cover the wheel in any position in which it may be turned for the purposes of steering the vehicle. Pressings are used in other ways to protect alike the rider and the mechanism completely from mud, the single cylinder alone projecting between the rider's legs. No front forks are used, the wheel being supported separately within the hub. The steering column is connected to the wheel by means of a short arm and a tie rod; this detail admittedly follows motor-car practice, save that the problem is to deal with one wheel only, as distinct from an axle and two wheels. The suspension details are well thought out.

In regard to side-cars a deal of attention has been paid to sporting types, and, in one or two cases, to goods carrying types, such as chemists' vans. Of interest to medical men is the Royal Enfield side-car, wherein either a quantity of luggage or several tins of fuel can be carried, and more luggage, or fuel, can be disposed on the horizontal lid. Tools are accommodated under the seat. This firm's family side-car is improved in design to provide several inches more leg-room by taking the upholstery of the rear seat quite to the back of the body and carrying the luggage on a folding grid. A stool seat, provided with this side-car, can be bolted in any position desired. The Matchless tandem two-seater type side-car has, of course, the wind-screens disposed one behind the other, and is distinctive in that the floor boards for the front seat are collapsible.

Miscellaneous Exhibits.

It is plain that this year motor cycle builders and users alike have thoroughly grasped the point that it is economical as well as comfortable to fit a mount with the largest pneumatic tyres it will take. To meet the demand tyre makers are producing a variety of over-sizes. Buyers have become educated to the point of being quite willing to pay the extra initial outlay needed to acquire them, because they appreciate that in return these are relatively immune from punctures and other troubles and have more than proportionately longer wearing life. Of course all the tyre makers claim that their particular pattern of tread is the best to prevent skidding, and it is observable that the number of varieties of patterns employed does not diminish. It may be pointed out, however, that the engineering principle involved is that the use of circular or fluent curves only is not as efficient as a design wherein the principle of as sharp angles as possible is exploited.

In addition to ordinary motor cycle tyres, the Dunlop Rubber Company introduces a series of heavy covers, to suit flat base rims, with car type beads, the whole being built up on the lines of car tyres. These are available in 26 by 2½ in., 26 by 3 in., and 28 by 3 in. sizes. Dunlop Magnum tyres are now made to suit the following rims: 650 by 65 mm., 700 by 80 mm., and 26 by 3 in. in cord. The Magnum cover takes the form of large staggered studs with rows of small studs on the outside, there being a central longitudinal ridge round the moulding. In regard to electrical apparatus, apart from Maglitas for single and for flat twin-cylinder engines, the M.-L. Magneto Syndicate introduces in the E. type of this apparatus a design suitable for light-weight motor cycles. Several advantages not embraced in earlier models are combined in the new pattern switch gear for use in connexion with the Maglita apparatus, a more compact battery unit being also shown.

SMALL CAR DEVELOPMENTS.

In connexion with the large number of small cars shown at the recent motor-carriage exhibition at Olympia and at the White City, the display was not, of course, completely representative of all the makes introduced to the home market. Therefore the present opportunity may be taken to mention that a novelty from Italy is the four-cylinder, overhead valve engine, 12.1-h.p. Treasury rating, £13 tax, 70 by 120 mm., 1,847 c.cm. Ansaldo, wherein the cylinder heads are detachable. The ignition is by magneto. An electrical engine starter is standardized. This machine follows in sundry details the main tendency of high grade English middle size car productions, the power being transmitted through a disc clutch to a gearbox giving three speeds forward, whence the drive is passed through the back axle by spiral bevel gear. Steel disc wheels are used. The suspension is by half elliptic springs fore and aft. In regard to cars of sizes of interest to medical men which were staged at the recent exhibition, but which were not mentioned in the review at the time owing to the exigencies of space, it may be pointed out that the £13 tax, 12–14-h.p., four-cylinder 70×120 mm., 1,847 c.cm. De Dion-Bouton chassis has been little altered. There are, however, changes in the wheelbase and track, both of which have been increased by a matter of four inches. Moreover, the foot brake now acts on drums attached to the rear wheels, and the hand brake on the cardan shaft, thereby meeting the ever-increasing demand for brake control which shall be according to the instinctive principle. A speedometer drive is now fixed to the front end of the propeller shaft. Some of the coupé and the cabriolet coachwork schemes standardized by this firm are interesting.

VOLUNTARY HOSPITAL FINANCE.

AT a meeting on November 9th the president and general council of King Edward's Hospital Fund for London adopted a resolution affirming that the condition attached by the Treasury to the temporary assistance voted by Parliament to voluntary hospitals requiring that fresh money should be raised pound for pound, and expressed the opinion that the application of this condition, which was not recommended in the report of Lord Cave's committee, nor separately considered (much less expressly enjoined) by Parliament, will lead to great difficulties and probably to great injustice as between different hospitals in the distribution of the grants. It has therefore asked that the condition should not be pressed. The Chancellor of the Exchequer has replied that the pound for pound basis is absolutely fundamental, adding that, in view of the present financial position, it should be made perfectly clear that the £500,000 grant is the limit of Government assistance to voluntary hospitals.

ROYAL MEDICAL BENEVOLENT FUND.

THE following is a summary of some of the cases considered at the last meeting of the Committee; twenty cases were considered and £262 voted to eighteen applicants.

M.R.C.S.Eng. and M.D.Brux., aged 49, suffers from epilepsy and is at present in hospital. Owing to indifferent health has had no practice for seven years. His wife's income of £50 per annum is all that they have to depend upon. Voted £26 in twelve instalments.

Widow, aged 67, of L.R.C.P.Edin. who during the war served as a ship surgeon, and was drowned in a collision in 1917. Applicant has been living on a small legacy and £100 granted her by the owners of the ship. These funds are now exhausted, and she is now living on proceeds of sale of jewellery and is nearly at the end of her resources. She is willing to take a post to enable her to support herself, but finds her age against her. Voted £18 in twelve instalments.

Daughters, aged 57 and 49, of L.S.A. who died in 1903. Owing to ill health they are unable to support themselves. Their joint income amounts to £82. Relieved by the Fund thirteen times. Voted £18 in twelve instalments.

Widow, aged 58, of M.B.Aber. who died in 1912. All savings were used up in expenses connected with late husband's and daughter's illness, and applicant was left without means, and owing to ill health is unable to work for a living. Voted £18 in twelve instalments.

Widow, aged 40, of L.R.C.P.Edin. who died in 1916. Applicant was left with four children with an income of about £95 per annum; the children's ages now range from 7 to 15 years, and they are all at school. Apart from the income of £95, she received this year £7 10s. towards education, and £48 from a lodger. Voted £18 in twelve instalments.

Subscriptions may be sent to the Honorary Treasurer, Sir Charters J. Symonds, at 11, Chandos Street, Cavendish Square, London, W.1. The Royal Medical Benevolent Fund Guild is overwhelmed, in these days of exorbitant prices for clothing and household necessaries, with applications for coats and skirts for ladies and girls holding secretarial posts, and suits for working boys. The Guild appeals for secondhand clothes and household articles for the benefit of the widows and children who in happier times would not have needed assistance. The gifts should be sent to the Secretary of the Guild, 43, Bolsover Street, W.1.

British Medical Journal.

SATURDAY, DECEMBER 3RD, 1921.

THE ASSOCIATION IN 1921.

THE work of the British Medical Association must necessarily reflect the external conditions of any given period. It is well to keep this fact in mind in examining the record for 1921. For the most salient characteristics of the year have undoubtedly been exhaustion and disappointment—economically, politically, and socially. Unemployment and trade stagnation, with wages falling to the level of subsistence, mark the breakdown of the economic system. Established institutions have proved inadequate under the strain of transition, and some more recent formulas have failed to stand the test of practical application; witness the collapse of the newer industrial unionism with the "Triple Alliance," the substitution of economy for reconstruction as a political watchword, and the postponement of a programme of constructive reform to the immediate provision of partial and temporary amelioration. At such a time to advance might well seem hopeless, and not to have failed a valid title to success.

Such are the external conditions under which the work has been done. What, then, is the general impression left by a scrutiny of the actual record? In the first place there emerges from the mass of detail the impression of stability and vitality. The ultimate goal remains unchanged; the methods are those proved by experience through evil and through good report, but capable of variation and modification to suit special circumstances by virtue of the local freedom and initiative inherent in the democratic scheme of organization. The absence of effective opposition at a time when all authority is questioned is sufficient testimony to this adaptability. This general effect owes something to the character of the background. The impression is, however, heightened by a closer study. The resources of the Association have been increased by the operation of the increased subscription, and in a wider sense by an increase in membership hardly affected by the heavier material contribution demanded. The increase in membership—which is shown graphically in a chart in this week's SUPPLEMENT—is limited to no one section of the profession and to no particular locality, but it is partly conditioned by successful service for particular groups, as in the case of the 116 members of the I.M.S. recently enrolled.

Whilst the membership has increased, the records of the central office show a parallel increase in the volume and complexity of the work undertaken for the individual member. Information and advice given by the office, on such widely differing subjects as the assessment of income tax and the fees payable for expert evidence in the courts, have resulted in pecuniary advantage to the inquirer. In spite of falling wages and in the teeth of an indiscriminate campaign for economy, it has been possible, in the majority of instances, to counter any infringement of the Association's minima for public health posts. Such devices as the public advertisement of a post at the accepted rate, and its subsequent offer to the successful candidate at a reduced rate, have been successfully met; conditions of service have been readjusted, and remuneration unfairly withheld either through error or intention has been secured. Neither distance, as in the case of the Colonial Medical Services, nor service restrictions as in the R.A.M.C., have prevented such aid being effectively given. Fees have been raised in a certain number of cases, amongst which may be cited the fee for medical examination of civil service candidates, the remuneration of Admiralty surgeons and agents, and the terms for medical examination of school children in a Scottish district. In an increasing number of cases the ethical machinery of the Association is utilized by members (and by non-members, too) for the adjustment of disputes. The renewed mandate of the Insurance Acts Committee is sufficient indication of the validity of the Association's claim to provide for the needs of the insurance practitioner.

The work for the individual, essential though it is, must remain dependent upon and subordinate to the work for and through the local unit of organization and the group or section on whose behalf collective bargaining can be conducted. Hence the extension and consolidation of the divisional or branch machinery is of equal importance with the extension of membership. New Branches in Mesopotamia and Fiji show vitality in this respect, whilst a first step has been taken towards the readjustment of relationships within the Association by provision for incorporation of overseas Branches and the formal recognition of the Dominions Federal Committees. In the matter of remuneration the period has, from the nature of the economic situation, been one of consolidation rather than advance; but in the matter of conditions of service the final attainment of security of tenure for public health officers, achieved in one out of a total of twelve private members' bills which reached the statute book last session, calls for notice.

The agreement with the Colonial Office as to the transmission of information and the consideration of representations has materially increased the capacity of the Association to promote the interests of the Colonial Medical Services in the general reorganization of Colonial administration now in progress. Finally, and subject to the consent of the local units of organization, a means has been devised for meeting the particular needs in the matter of self-determination within the Association of so small and so remote a group as the medical officers of the Indian railways.

As the work of the Association for the individual is conditioned by its work for the group, so the service rendered to the group is, in the long run, conditioned by its service to the profession as a whole. Here also there is progress to record. The long deferred restoration of the notification fee must not be omitted from the tale, but the work done in connexion with the Dangerous Drugs Regulations requires more detailed consideration, for it is of significance as an illustration of effective service at short notice. It is still more significant as illustrating the utility, in the interest alike of the public and of the profession, of recognition of the Association for purposes of consultation as a preliminary to administrative action. To such recognition we owe the fact that blunders of this nature are comparatively rare.

The value of notification fees and Home Office regulations is easy to assess. More complex, and incomparably more significant, is the work initiated in connexion with the development of the public health services. The conferences of committees on the subject of municipal clinics and hospitals and the relation of the private practitioner to the system are a distinct, if belated, step towards healing the breach between preventive and curative medicine

which threatens to destroy the unity and impede the progress of medical science. No less important for the future development of medicine is the fact that during the present year the Association has succeeded in concentrating the attention of those concerned upon the medical aspects of the hospital problem. To central action in these matters local action is an essential complement: Willesden in 1921 has followed Bradford in 1920 in an effective vindication of the claim of the local profession to consultation in the interests of the public.

The work of the Association has so far been presented as a contribution to professional needs, but the year is marked by the development of another aspect of the work, an aspect which cannot be long ignored. For as the Association exists for service of the profession, so the profession exists for service of the community through science, and an essential condition of such service is the active co-operation of the community. But the condition of such co-operation is the concentration of professional opinion on matters of public importance, and its exposition by accredited representatives. Government departments, local authorities, voluntary organizations — vocational, scientific, and philanthropic—show an increasing tendency to invite the help and co-operation of the Association on matters in which medical opinion is of weight. The response of the Association is measured only by the extent to which the state of professional opinion makes an authoritative answer possible. Its readiness to respond to this method of co-operation and to develop in the public interest is illustrated centrally by the work of the Medico-Sociological Section and the experimental appointment of the Medico-Sociological Committee; locally by the action of the South Essex Division in co-operating with other local organizations in matters of common interest.

It is usual in a summary of recent progress to give some space to current criticism. In this case we may anticipate the critic in a reference to the reduction of the insurance capitation fee as evidence that the Association had failed to secure effective organization of the profession. The facts of the case may be described in their appropriate setting as follows: In 1921, at a time of great social distress, when wages and the salaries of public servants had suffered drastic reduction (and even the police, whose bonus had just been reduced, had voluntarily offered to work overtime without payment as a contribution to public economy), insurance practitioners, through their accredited representatives, and with certain reservations, accepted a reduction of remuneration. The alternative to this reduction was the abandonment of a public service which, in the opinion of a majority of those engaged in its conduct, was beneficial to the community and capable of improvement and expansion in the public interest.

Turning to the other main aspect of the Association's work, we may note that the Annual General Meeting, held at Newcastle-upon-Tyne in July, under the presidency of Professor David Drummond, was highly successful. The attendance at the sections was well maintained and the discussions reached a high level of interest. In his address on the future of the medical profession, the President showed where the weak places in medical education might be strengthened. He emphasized the importance of the special training of students in the recognition of the early stages of disease, and the value of post-graduate institutions. A reference in the course of the address to the need of greater facilities for *post-mortem* examinations was made too much of in the daily newspapers; it was by no means its leading feature. Sir Thomas Oliver delivered a special address on the subject which he has made peculiarly his own—the rise, progress, and opportunities of industrial hygiene—and he showed how its importance has grown with the ever-enlarging sphere of industrial enterprise. The popular lecture on evolutionary wounds, by Sir Arthur Keith, was one of the striking features of the meeting. In his own words, he "stood back a little from his laboratory bench to try and make his audience realize the miraculousness of the mechanics of embryonic evolution," and in doing so he fascinated the lay section of his audience not less than the members of the Association.

At Newcastle, as at Cambridge, some of the sections met on three days, others on two, and others again on one only; this precedent will probably, we understand, be followed at the Annual Meeting next year at Glasgow. Demonstrations were given in connexion with most of the sections during the afternoons, and were well attended. The Section of Medicine devoted its first discussion to the subject of visceral syphilis, a subject so wide as to appeal to nearly every branch of medicine and surgery. The section had the advantage of hearing the subject opened by Sir Clifford Allbutt, and the debate was kept by subsequent speakers to the high standard he set. Asthma and allied disorders was the subject discussed on the next day, followed on the third day by a joint discussion with the Section of Pathology and the Section of Physiology and Pharmacology on the subject of encephalitis lethargica. In the Section of Surgery, presided over by Professor Rutherford Morison, the main subjects for discussion were, on successive days, acute pleural empyema, compound fractures of the thigh and leg, and the diagnosis and treatment of injuries of the intestines.

The Section of Pathology and Bacteriology held on the first day a discussion on haemochromatosis, while on the second day a number of interesting and important shorter papers were read; its pathological museum had a large and varied exhibition of interesting specimens on view. The Section of Preventive Medicine with Industrial Diseases included in its proceedings discussions on the effect of health legislation upon the health of the people, and on the importance of industrial medicine to the community. The Section of Orthopaedics and Diseases of Children had a long programme; the first discussion, on the early diagnosis and treatment of anterior poliomyelitis, was opened by Mr. A. H. Tubby, who was followed by eminent orthopaedists, not only from this country, but from America; next day blood diseases in children were discussed, and on the third day the general principles of treatment in tuberculosis of bone in children. The Section of Neurology and Psychiatry had as its chief feature a discussion on the diagnosis and treatment of borderland cases, and on the second day a number of shorter papers on various neurological topics were read. The Section of Ophthalmology discussed the causes and prevention of blindness, and the treatment of corneal ulcers. The Section of Oto-Rhino-Laryngology had a very full and successful programme; on the first day it discussed problems in connexion with meningitis occurring in aural cases, and on the second the problems presented by haemorrhage in tonsil operations. The proceedings of the Section of Physiology, Pharmacology, Therapeutics, and Dietetics included a number of short papers and demonstrations on subjects coming within the wide purview of the section. In the Section of Venereal Diseases the first day was given to the discussion of the treatment of syphilis, and the

second to the treatment of gonorrhoea. The place of Caesarean section was the opening subject for discussion at the first meeting of the Section of Obstetrics and Gynaecology, and on the second day the neurasthenic element in midwifery and gynaecology received consideration

The remaining sections of the meeting, which met on one day each, included the Section of Ambulance and Red Cross, at which several interesting demonstrations were given, and the Section of Proctology, which discussed the surgical treatment of internal haemorrhoids; the Section of Dermatology discussed, among other subjects, the association of skin tuberculosis with other tuberculous manifestations. In the Section of Medical Sociology a debate took place on the relation of the medical profession to local authorities. In the Section of Radiology and Electro-Therapeutics a number of important subjects were discussed, including the changes induced in blood constituents by radiation. The Section of Urology had short discussions on cystitis, prostatectomy, and other urological subjects.

The British Medical Association lectures, arranged at the request of individual Divisions or Branches, have proved very popular, and in other directions there has been a welcome revival of the clinical and scientific work of the Branches and Divisions throughout the country, as the following examples—taken at random from different districts—show. Thus the City of London Division is holding monthly meetings throughout the winter at which demonstrations on practical subjects of everyday use in medical work are given, while other clinical meetings are held in conjunction with the Aesculapian Society. The programme of the South Middlesex Division includes, in addition to ordinary clinical meetings, monthly meetings at which discussions on such practical subjects as "minor disabilities of the feet" and "the early diagnosis of tuberculosis" are opened by well known physicians and surgeons. The Brighton Division has arranged a series of nine clinical demonstrations on medical and surgical cases, children's diseases, tuberculosis, and on neurological and special cases, at the different hospitals in Brighton. The Bath and Bristol Branch makes a feature of the scientific papers at its ordinary meetings, and also includes clinical meetings in its programme. The Leicester and Rutland Division has had discussions on such subjects as the cause and treatment of asthma and the place of the Wassermann reaction in general practice, and is holding clinical meetings. The Halifax Division has monthly meetings at which the exhibition of cases and specimens is followed by discussions on subjects of everyday importance. The East Yorkshire Division similarly has monthly meetings to discuss subjects of practical interest in medicine; the speakers at these meetings have included Dr. B. H. Spilsbury of St. Bartholomew's Hospital and Sir William Thorburn of Manchester. The Edinburgh Branch, in addition to its ordinary meetings, holds every winter, in association with other Scottish Branches, a special clinical meeting in the Edinburgh Royal Infirmary. Last year at this meeting, which was most successful, demonstrations were given in the wards and special departments of the infirmary; papers were read by a number of authorities, including Dr. J. S. Haldane of Oxford, on their particular subjects, and a pathological museum was arranged. Similar activity on the scientific side of the work of the Association is in full vigour at Birmingham, Newcastle-upon-Tyne—the North of England Branch has always made a feature of its clinical meetings—and elsewhere.

CLAYDEN V. WOOD-HILL.

We publish elsewhere in this issue (p. 967) a letter asking for subscriptions to a fund which has been started to reimburse Dr. Wood-Hill for the very heavy expenses incurred by him in defending an action brought against him for alleged negligence in the treatment of a fractured femur. The signatories to this appeal—Sir Robert Jones, Mr. G. E. Gask of St. Bartholomew's Hospital, Mr. R. C. Elmslie, who operated upon the case after a second fracture, Sir John Lynn-Thomas, Sir Hamilton Ballance of Norwich, and Dr. Wilson Tyson of Lowestoft—do not hesitate to express the opinion that a grave miscarriage of justice has occurred. We believe that those who read the report of the trial in our issue of last week (p. 919), together with Mr. Elmslie's letter in that issue (p. 916), will agree with the distinguished signatories of the letter published this week. Attention may be specially directed to the observations of Mr. Elmslie, who operated upon the patient between two and three weeks after the incident which happened when the patient had been ten days at home. He points out that there was a distinct conflict of evidence on matters of fact regarding the treatment applied during the eight weeks the patient was in the Beccles Hospital; these methods, he states, were in accordance with the usual surgical teaching. The judge and jury appear to have been largely influenced by Mr. Elmslie's answer to the question whether, at the operation, he found evidence of refracture. While stating that he had not found such evidence, he pointed out that the interval between the giving way of the leg and the operation—eighteen days—was sufficient for signs of refracture to have disappeared. In his letter last week he pointed out that both judge and jury seem to have ignored the possibility of bending of the callus, a well known and common incident in fracture of the femur, and a possibility he emphasized in his evidence. We believe that the profession generally will agree with Mr. Elmslie's further observation that the decision in this case shows a tendency to extend medical responsibility for the results of treatment beyond the acknowledged responsibility to use recognized methods and to use them carefully; for it would appear that the mere fact that the result of the treatment of the fracture was unsuccessful was accepted as a sufficient cause for action. The signatories of the letter we publish this week state that abundant evidence was produced at the trial that as regards splinting, extension and position of the limb, the fracture was treated in accordance with modern methods while the plaintiff was in the Beccles Hospital. The decision being on a matter of fact does not, we understand, constitute a precedent in law, but sooner or later the underlying principle will have to be tried out. Acting in accordance with the recommendations of his legal advisers, Dr. Wood-Hill does not intend to appeal, so that the matter cannot be reargued in a court of law; but the profession can at least show its view of the matter and its sympathy with Dr. Wood-Hill by subscribing liberally to the fund now. As will be seen, Sir Hamilton Ballance, All Saints Green, Norwich, has undertaken to act as treasurer.

THE CALCUTTA SCHOOL OF TROPICAL MEDICINE.

The Calcutta School of Tropical Medicine and Hygiene began work on November 15th, when the director, Lieut.-Colonel Megaw, I.M.S., sent a telegram of congratulation to Sir Leonard Rogers announcing that the first lectures had been given. The Carmichael School of Tropical Diseases was opened a few days later. The history of the foundation of the school and of the many delays it has encountered has been related from time to time in our columns. The scheme of the school was worked out by Sir Leonard Rogers some eleven years ago, and it is some years since the staff was sanctioned by the Secretary of State, though the appointments remained in abeyance until the conclusion of the war. After the

school in its original form had been sanctioned, extensions to include research and the teaching of hygiene were worked out, and the scheme in its complete form was approved by the Sanitary Reorganization Committee of the Bengal Government nearly two years ago and submitted to the Government of India, which suggested certain modifications with regard to pay. The scheme was forwarded to the Secretary of State for India for his approval early this year, and by him referred to the newly appointed Indian Minister of the Bengal Government; he appointed a committee, which approved of the full scheme, but objected to the reduction in salaries proposed by the Government of India. It was then finally approved by the Government and once more submitted to the Secretary of State; his sanction was, we understand, given last October, and the Bengal Government consequently agreed that the school should begin work at once. The hygiene section of the school has not yet been sanctioned and its staff has not been appointed. The research section, however, has been in working order for a year under the direction of the governing body of medical men set up under the scheme. The research fund subscribed by the public in response to Sir Leonard Rogers's appeal yields an annual income of a lakh of rupees, and is administered by this governing body. Important work in the diagnosis of kala-azar and the treatment of leprosy has already been done. It is not too much to hope that before many years have elapsed the full staff will have been sanctioned by Government; it will number 42 and include well qualified medical assistants. We may be permitted to express to Sir Leonard Rogers on behalf of the profession its congratulation on the completion of an undertaking which will worthily commemorate his great services to India and to tropical medicine.

INDUSTRIAL MEDICINE AT THE INTERNATIONAL LABOUR CONFERENCE.

THE International Labour Organization, which was established by Part 13 of the Treaty of Versailles, and the members of which are the States composing the League of Nations, held its third Conference at Geneva from October 25th to November 19th. The problems of medical interest which have come before this assembly relate to the prohibition of white lead in painting, the disinfection of wool infected with anthrax spores—to which we refer elsewhere this week—and the compulsory medical examination of children and young persons employed at sea. On this last subject a Convention—which is an agreement to take in each country such legislative and administrative action as may be necessary to establish an international equivalence—providing for the medical examination of children and young persons employed at sea was adopted by 96 votes to none, with one abstention. In regard to lead poisoning, a questionnaire was addressed to the various Governments, asking whether, in view of the fact that it is now possible to replace white lead in painting by efficient substitutes, they were of opinion that a draft Convention prohibiting its use should be submitted to the Conference. Seven governments replied in the affirmative, six others in the affirmative with limitations or reservations, and the remainder made reserved or ambiguous replies. The reply of Great Britain was to the effect that further investigation was needed, especially because quite recently further evidence had been submitted as to the results with leadless paints, and this appeared to throw some doubt upon the conclusions arrived at by the two committees set up by the Government in 1911 which recommended the total prohibition of paint containing more than 5 per cent. of its dry weight of a soluble lead compound except for certain special uses. Until this evidence had been carefully examined the British Government regretted that it could not express any decided opinion as between prohibition and regulation. The draft Convention submitted to the Conference prohibited white lead or any specialized product containing white lead, but admitted certain exceptions, as, for example, in artistic painting and fine lining, and also in painting work, other than on buildings, which is to be permanently exposed to the open air, such as on carriages. Any exemptions which might be granted by the Governments, however, were not to cover the employment of women or young persons. The report pointed out that plumbism is not only responsible for a number of deaths but causes a high rate of sickness among painters, and makes them less capable of resisting infectious disease. The German Government was of opinion that white lead should be prohibited only for interior painting at present, and made three recommendations for better protection against plumbism: (1) That white lead should only be sold when ground in oil; (2) that all vessels containing lead paints or compounds for sale should bear an indication that they contain lead and are dangerous to health; (3) that all painters who use lead paints should be subjected to periodical medical examination. The two questions, of white lead in painting and of anthrax in wool, were those which excited most controversy. Each was responsible for several inconclusive discussions, both in committees and in the full assembly. The Convention on the prohibition of white lead as originally drafted has been amended, and in its final form, as adopted by the Conference by 76 votes to 3, prohibits the use of white lead or lead sulphate and all pigments containing these substances for interior painting, except in the case of railway stations and factories, where lead paints may be considered necessary by a competent authority. The prohibition is to come into force six years from the statute of the recent Conference. With regard to the disinfection of wool, the article published elsewhere gives full particulars of the decisions of the Conference and of the considerations which led to their adoption. The Conference took special note of the disinfecting station at Liverpool, illustrations of which we publish on a special plate this week.

THE ANTHROPOMETRY OF SCHOOL CHILDREN.

THE annual report, covering the two years 1918 and 1919, of the Principal Medical Officer to the Department of Education, New South Wales, contains, with other items of interest to the medical administrator, an important contribution to the statistics of height and weight at school ages. In all more than 200,000 children were examined; the majority—over 180,000—were pupils in the State schools, while most of the remainder came from schools connected with the Roman Catholic religion. The principal results of the analysis were these: In respect of weight, boys are heavier than girls between the ages of 5 and 11; girls are heavier than boys from 11½ to 15; boys then regain the lead. In respect of height the same sexual relation is observed. When a comparison is instituted between the school children of the capital, of the larger country towns, and of the rural districts, it is seen that the rural children are heavier and taller than the city children at every age, and somewhat superior to the children from the country towns. When children are classified by parentage it appears that those both of whose parents were Australian are heaviest and tallest; next come children with one parent Australian, while the children of two "foreign" parents are the smallest. Mr. F. A. Mecham, statistical officer to the department, who is responsible for the analysis, has illustrated the tables with a series of excellent graphs. Dr. Harvey Sutton, in his discussion of the results, calls attention to the importance of such surveys in providing data for a scientific appreciation of the problems of nutrition and to the need for extending them—as, for example, by recording other measurements, such as vital capacity, area of cross-section of the chest, dynamometer grip. Dr. Sutton says truly that we are at present quite unable to assess the

respective shares in the etiology of malnutrition due to such probable factors as lack of fresh air and dental caries. In commenting on the latter, Dr. Sutton writes that it is "probably a contributory rather than a main cause of child malnutrition. The worst sets of teeth tend to be found in the ill-nourished, while good teeth are most commonly confined to the children above standard. This and the future risks fully justify the fullest dental treatment for school children, but by no means solves the problem of nutrition." Mr. E. C. Rhodes, of the Galton Laboratory, University of London, states in a recently published memoir that he has found little correlation between the state of nutrition and the condition of the teeth, but notes the extreme difficulty of reducing to a common standard the findings of different medical officers. Dr. Sutton's appeal for further knowledge and Mr. Rhodes's comments on the need for standardization of medical judgements ought to be considered together. We fully endorse Dr. Sutton's contention that such knowledge is required, but we think that in a populous country like Great Britain it must be obtained by the method of sampling rather than by that of exhaustive enumeration. Far more value would attach to a survey of every tenth, or even of every hundredth, child of school age made by a small number of trained investigators than can ever be accorded to the *omnium gatherum* of routine inspections made by persons all, no doubt, keen and intelligent, but of varying grades of training and experience.

ERLANGEN.

THE claims of the Erlangen school in the treatment of cancer by radiotherapy have been referred to several times in our columns of late (August 20th, 1921, p. 290; August 27th, 1921, p. 331), and they were discussed in the Section of Radiology at the Annual Meeting of the British Medical Association at Newcastle. In this country the leading authorities have expressed the opinion that the time has not yet come when radiotherapy may be regarded as the first choice, in place of surgery, in the treatment of cancer; but that, in spite of somewhat extravagant claims, the Erlangen school has made a real contribution to progress, and that its methods are worthy of serious attention. The requisite apparatus, which has been much "written up," is now made by several firms in this country. A few years ago the name Erlangen conveyed little to medical men outside Germany, but now the rush from all quarters of the world to study actinotherapy at Erlangen is said to have become so large that its gates have been closed to most newcomers. We have reason to believe that this difficulty of access was temporary, and political in origin. Many English medical men and physicists have visited Erlangen lately, and they are alive to the possibilities of the treatment carried out there. In Germany the reputation of Erlangen has suddenly eclipsed even that of Freiberg and Berlin. Yet Erlangen is a comparatively small provincial university town, dominated by only two concerns—the university with its woman's hospital and the firm of Reiniger, Gebbert and Schall. This firm has representatives all over the world, from Norway to the Argentine and Japan, and has not let the grass grow under its feet. In *Hospitalstidende* for July 20th and September 28th Dr. Severin Nordentoft tells how he succeeded in getting from Denmark to Erlangen, and how he was not only successful in running the blockade, but also in getting first-hand information from the Erlangen authorities. In response to his first effort to reach Erlangen he was served with a circular from Reiniger, Gebbert and Schall, in which it was stated that medical visitors could not be received on account of the congested state of the town. His next rebuff came from the passport authorities, who were willing to visa his passport to Berlin and Hamburg but not to Erlangen. Dr. Nordentoft, however, had friends at court, and through Professor Hans Meyer, Editor of *Strahlentherapie*, he received an introduction from Professor Wintz, who intimated that he would receive Dr. Nordentoft. So his passport was visaed only for Berlin, whence the journey to Erlangen proved unobstructed. According to Dr. Nordentoft's account, the results achieved at Erlangen are due to the intimate co-operation of the university authorities and the firm mentioned above. A third partner in this collaboration is a firm of *x*-ray apparatus manufacturers in Hamburg. The engineers and technical experts keep constantly in touch with the hospital, the staff of which is kept *à jour* with the experiments of the firm. After giving a long and technical account of the apparatus Dr. Nordentoft supplies some general information on the subject, and winds up his paper with a caveat addressed to the amateur radiologist who, in a small provincial hospital and with faulty apparatus, essays the *x*-ray treatment of cancer and so runs the risk of favouring instead of checking its malignancy. We have made arrangements which we hope will enable us to publish at an early date further particulars with regard to the latest work done under the direction of Professor Wintz, who, while he believes that the methods in use at Erlangen constitute a move in the right direction, himself strongly deprecates sensational publications which can only raise false hopes in the minds of patients suffering from cancer.

THE HUMANITIES IN SCIENTIFIC TEACHING.

A PLEA for humanism in scientific education was put forward by Professor Cecil H. Desch at a meeting of the Royal Anthropological Institute on November 23rd. He deplored the lack of knowledge of science on the part of responsible men in this country, whose education had been based upon literature, and more particularly upon classics, but at the same time expressed his regret that through the enormous extension of scientific and technical education of recent years large numbers of men were being sent out into responsible positions in industry without being touched in any way by the humanities. The outlook of such men might be as narrow as that of the men whose education had taken no account of science at all, and they might prove even less capable of administering human material than men trained under the old classical system. The science teaching of the present day was taken to include mathematics, physics, chemistry, biology, sometimes a little psychology, and such parts of the study of mankind as related to prehistoric races and primitive civilizations. But as long as the study of the higher civilizations was excluded science remained too narrow a discipline. Mere training in technology made for a hard and selfish efficiency, and commercial training aggravated this fault. On the other hand, to introduce a certain number of courses in literary subjects into the science training, like the introduction into the literary course of a certain limited instruction in science, would, under present university conditions, overload the curriculum without any corresponding advantage. The important point was to make the student realize that knowledge was one thing and not an aggregate of disconnected subjects. In some way the science student must be given the synthetic outlook upon the universe. Professor Desch urged that the science course should be completed by sociological study, not limited to the primitive races, but embracing civilization as a whole. Were this done, science and humanism could no longer be said to be in conflict. He looked forward also to more of the historical spirit in science teaching. The student in science should be taught how his subject grew, he should know the lives of its founders, and be acquainted with their original writings, which would afford him a better insight into the subject than many textbooks. He should also learn the relation of each discovery in pure science to the state of intellectual development at the time it was made. As for linguistic study, Professor Desch agreed that the science student

would not have time to follow this with any thoroughness, but there was no reason why ignorance of the ancient languages should imply ignorance of the ancient literatures. This country was fortunate in having translations which themselves ranked as literature. There were educationists who despised all translations, but to them it might be pointed out that there were two literatures with which every person in this country made acquaintance through the medium of translation—namely, the Old and New Testaments. He pleaded for a recognition in humanistic education of translations of old classical writers. Classical education was not necessary to scientific writing; one of the most eloquent and also one of the most accurate of modern English writers was Huxley, who had no education in the classics. Professor Desch commented adversely on the loose English and the jargon which found their way into many scientific periodicals to-day, but he urged that it was quite possible, if the science student was instructed in the use of his own language, and encouraged in clear expression, to present scientific facts in simple and direct English, like that of Faraday, for example. Dr. Charles Singer, in the discussion which followed, while expressing his agreement with Professor Desch in his main thesis, held that there was more to be said for linguistic study than Professor Desch had admitted. It must be a great help to be able to compare one's own language with another, and Latin alone among languages—he would not even add Greek, nor would he regard French as a modern equivalent—supplied the required "norm."

VACCINES IN CATARRH.

SURGEON COMMANDER D. H. C. GIVEN, in the October issue of the *Journal of the Royal Naval Medical Service*, publishes the results of an investigation of considerable interest on the use of an anticatarrh vaccine in a limited number of cases. He found that in the Royal Navy chronic catarrh and repeated colds seemed to be particularly prevalent among the personnel in destroyers. Many men stated that they had not previously been subject before joining destroyers, and no doubt the crowded mess decks and the limited supply of fresh air, particularly at sea, were important predisposing causes in that type of ship. At first the mistake was made of inoculating all comers without selection, with the result that many men came for inoculation who were either in the initial or convalescent stages of a cold. In such cases the vaccine was found to be very potent, and only aggravated the complaint. A further discouragement was the fact that a senior officer—who was a particularly susceptible subject and had had a similar attack after inoculation against influenza—was rendered extremely ill by one dose and was confined to bed for three days. Notwithstanding these initial calamities, though they had a serious effect on the number of volunteers, the final results were remarkably good, and Surgeon Commander Given was greatly impressed with the potentialities of an anticatarrh vaccine if given in selected cases and in more gradual dosage. In the cases under his observation inoculation was distinctly beneficial in from 55 to 65 per cent. of the men in different batches. The vaccine employed was "Prophylactic Anti-Catarrh Vaccine B," supplied by the Edinburgh Royal College of Physicians through Messrs. Duncan Flockhart and Co. It is well to bear in mind, however, that the first line of defence in prophylaxis against colds is fresh air and sunshine, thorough ventilation and cleanliness in living spaces, and prevention of dampness. The second is hygiene of the upper respiratory tract; an unhealthy condition of the nose and throat, due to mouth-breathing or nasal defects, seems to be as prevalent in the Royal Navy as bad teeth used to be. Under tolerably healthy conditions and in the absence of organic defect an anti-catarrh vaccine would appear to be a most important accessory in the prophylaxis of respiratory infections.

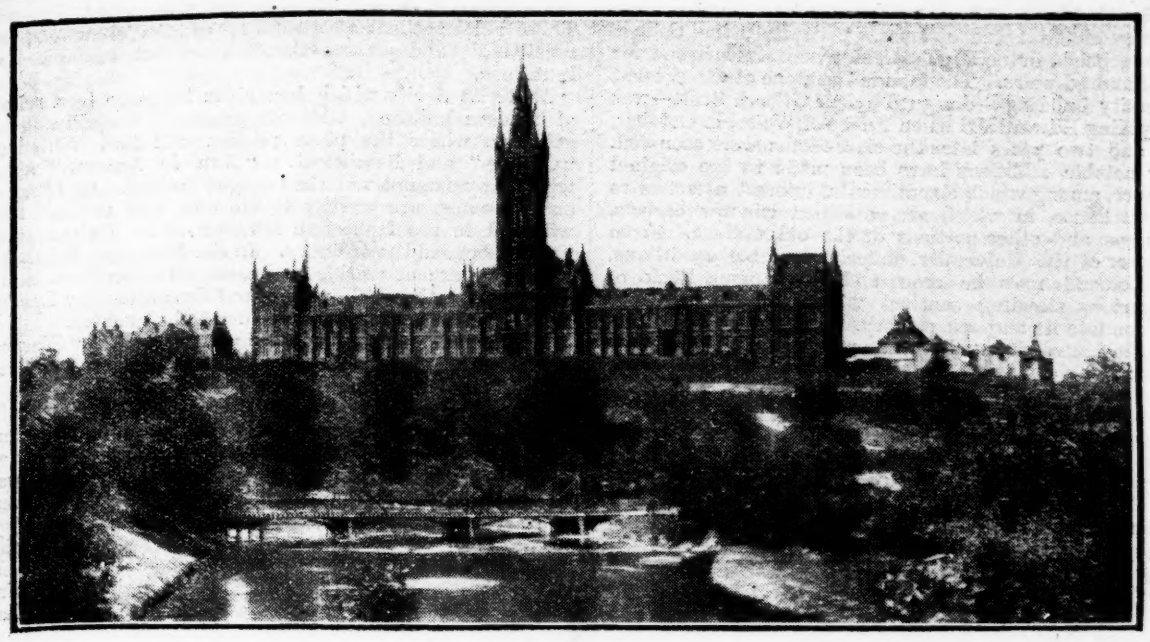
THE NEW POOR.

THE Professional Classes Aid Council is the new title of the organization which, under the name of the Professional Classes War Relief Council, rendered valuable service to thousands of persons belonging to the professional classes who were deprived by the war of their means of livelihood. During the past six and a half years some 12,000 applications were investigated and dealt with. First among its activities was the maternity home which was established in a house lent at Prince's Gate, where 547 babies were born in the four and a half years of its existence, and where also the general offices for the Council were situated. Educational assistance was next organized, and over £34,000 was expended on schooling for the children of professional people up to March, 1921. The war threw out of employment a large number of singers and other musicians, and by its organization the council was at once able to find work for them and to provide much-needed entertainment in hospitals and other institutions during the war. The influence of the war on the professions is far from being at an end even now, and hundreds of professional men and women will not be able to recover from its effects for years. Conferences have been held with the numerous societies interested, and as a result the War Relief Council was reconstituted and renamed. Representatives of the Council of the British Medical Association satisfied themselves that there was no likelihood of the work of the Professional Classes Aid Council overlapping with the work of the medical benevolent organizations, and that co-operation with it might in some instances be of considerable benefit. Accordingly, as was reported in the SUPPLEMENT of October 15th (p. 147), Dr. G. E. Haslip, Treasurer of the Association, was nominated as its representative upon the Professional Classes Aid Council, whose offices are now at 251, Brompton Road, S.W.3.

FELLOWSHIP OF MEDICINE.

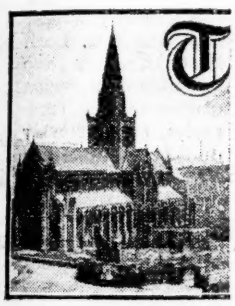
DURING the coming year the Fellowship of Medicine and Post-Graduate Association contemplates putting into operation a series of courses for medical graduates. These will be of two kinds—instruction in general medicine and surgery of the nature of "refresher" courses, and instruction in some special subjects, such as gastro-enterology, children's diseases, etc., for those desiring to devote special attention to them. In January a six-weeks' course will be commenced in medicine; in order to fulfil one of the admitted needs of the post-graduate, which is to separate his instruction from that of undergraduates, this course will be carried out at various special hospitals, and will include work in neurology, pulmonary diseases, diseases of the heart, children's diseases, fevers, infant welfare, and other subjects. Such institutions as the Brompton Hospital, the Cancer Hospital, the Hospital for Heart Diseases, St. Peter's Hospital, and the Hospital for Nervous Diseases, Maida Vale, have offered to take part in the programme. The meetings have been so arranged that, as far as possible, the work will be carried out each day at hospitals close to one another in order that the graduates' time may not be wasted in travelling to different parts of London. A provisional time-table for the course in general medicine is in preparation.

WE have received from the National Council for Combating Venereal Diseases a letter, signed by a number of physicians and surgeons, medical officers of health, and officers in medical charge of venereal disease clinics, who state that they have reviewed the whole subject and have formed their opinion on the question of self-disinfection after careful consideration. The conclusion which they come to is that the policy of promiscuous propaganda as to the security conferred by personal self-disinfection among the civilian population is likely not only to fail in its object in decreasing the amount of venereal disease but also may actually lead to an increase in the gross number of cases.



Photograph by] THE UNIVERSITY, GLASGOW. [Valentine.

NINETIETH ANNUAL MEETING
of the
British Medical Association,
GLASGOW, 1922.



GLASGOW CATHEDRAL.

THE ninetieth Annual Meeting of the British Medical Association will be held at Glasgow next summer under the presidency of Sir William Macewen, LL.D., F.R.S., Professor of Surgery in the University, who will deliver his Address on the evening of Tuesday, July 25th. The sectional meetings for scientific and clinical work will be held, as usual, on the three following days, the mornings being given up to discussions and the afternoons to clinical and laboratory demonstrations. The University Court has granted the use of the University buildings for the scientific and other purposes of the meeting. The Annual Representative Meeting will begin on the previous Friday, July 21st. The provisional programme for the work of the sections is being drawn up by an Arrangements Committee, consisting partly of Glasgow representatives and partly of members elected by the Council. The last day of the meeting, Saturday, July 29th, in accordance with the custom of previous annual meetings, will probably be set apart for excursions to places of interest near Glasgow and in the neighbouring West Highlands. We publish below a note on the City of Glasgow, being the first of a series of descriptive and historical articles on Glasgow which it is hoped will prove of interest to members of the Association. The Association met last at Glasgow in 1888 under the presidency of Sir William Gairdner.

GLASGOW: AN IMPRESSION OF THE CITY.

The appeal of Glasgow to the stranger depends greatly upon the weather. Under grey skies it is duller and more depressing than most cities, but in the summer sun of July it takes on a gallant air, and justifies the pride that its people have in their city.

A position of supremacy in commerce and industry, drawing as it does the attention of the trading world to the "Second City of the Empire," has in a measure dimmed an earlier distinction, for Glasgow is a cathedral city. The cathedral was built in the twelfth century on the site where, in the sixth century, St. Mungo, patron saint of the city, had set up his Christian cell, and part of the present fane dates from 1175. It has played its part in romance as well as in history, for Sir Walter Scott made of the dower church a rendezvous for his Highland reaver, Rob Roy. Other ancient buildings stand in Glasgow, but the cathedral is the first of them all, bearing its years bravely in stately austerity.

The College is of ancient foundation also, although the University buildings are modern. They stand on a noble eminence overlooking the fine Kelvingrove Park and a bend of the River Kelvin, from which one of the University's most famous professors took his title. Ranking next in age to St. Andrews University, Glasgow takes precedence of Edinburgh and Aberdeen, having been founded in 1450 by a Bull of Pope Nicholas V. The first students

were taught within the cathedral, and later in the town residence of the Laird of Luss. Ultimately the College was established in the High Street, where it flourished for three hundred years. The foundation stone of the present University buildings—designed by Sir Gilbert Scott—was laid by King Edward VII when Prince of Wales, in October, 1868, and two years later the class-rooms were occupied. Many notable additions have been made to the original structure, among which a sentimental interest attaches to the Gatehouse, in which are embodied window corbels, crowsteps, and other portions of the old College. From the tower of the University, under favourable conditions, Ben Lomond may be seen, and the famous Rock of Dumbarton, standing sentinel where the River Clyde broadens into its majestic estuary.

Of the University and its famous alumni John Mayne writes:

> "Here great Buchanan learnt to scan
> The verse that mak's him mair than man;
> Cullen and Hunter here began
> Their first probations;
> And Smith, frae Glasgow, formed his plan—
> 'The wealth o' nations.'"

With that of Lord Kelvin, the name of Lord Lister stands pre-eminent among its teachers, and there studied here in their time John Knox, Zachary Boyd and Tobias Smollett, James Watt the engineer, John Gibson Lockhart, "Christopher North," and Archibald Campbell Tait, afterwards Archbishop of Canterbury. It was in the forehall of the old College in 1662 that the Committee of the Privy Council met, under the Earl of Middleton, and, restoring Episcopacy, instituted the persecution of the Covenanters.

Photograph by] MUNICIPAL BUILDINGS AND GEORGE SQUARE. *[Valentine.*

The Botanic Gardens, perhaps the most pleasant of the parks belonging to the Corporation, are near the University, and at their eastern end stands Queen Margaret's College, where the women students of the University are instructed.

There is some remarkably fine architecture in Glasgow, to which, among men of the past, "Greek" Thompson was a notable contributor, while among architects of to-day Sir John Burnet, whose London work at the British Museum and elsewhere is well known, is represented by the Western Infirmary, the old Art Institution—now a drapery store—and a notable savings bank.

The city has splendid shops, and its hotels are well equipped and up to date, though another modern hotel would be a boon at conference seasons. While its restaurants are good, its teashops are without equal, and are a source of especial pride to the citizens of Glasgow. There are excellent theatres and concert chambers, and music-halls and picture theatres are innumerable and luxurious.

As befits a city which has given its name to a school of modern painting, Glasgow possesses magnificent art galleries, where the pious pilgrim will find Whistler's "Carlyle" and Rembrandt's "Man in Armour," along with many examples of the Glasgow School. Its libraries and museums are worthy of the city, and medical men will find in the Hunterian Museum at the University an interest beyond the ordinary. In the Municipal Buildings, within a maze of marble staircases and corridors, is the great banqueting hall, with mural decorations by Lavery, Roche, Walton, Henry, and others of their school.

It is a commonplace, at least in Glasgow, that "Glasgow made the Clyde and the Clyde made Glasgow," and the claim is made—with all due reverence, as becomes a kirk-going race—that the River Clyde of to-day, with its wide docks and clamorous shipyards, is an improvement on the original handiwork of the Creator. Kipling's Macandrew, it may be remembered, knew it "from Govan to Parkheid," and to its harbourage come argosies from the seven seas. Where, less than a century ago, apple orchards stood beside a quiet stream, there is now a thronging centre of human activity.

The communal services of the city are a marvel of enterprise and efficiency. Any guide-book will furnish details of the tramway system that has been a pattern to the world; tramcars carry the tourist a score of miles away to the banks of Loch Lomond. The city's water supply is drawn from Loch Katrine, in the neighbouring region of beauty, the Trossachs, so gloriously depicted by Scott in his "Lady of the Lake." Nor must reference be omitted to Glasgow as a starting point for excursions upon the Firth of Clyde and to the Highlands. A veritable fleet of pleasure steamers plies up and down the Firth, fares are astonishingly low, and to the citizens of Glasgow, Rothesay, Dunoon, and Arran are as familiar as Sauchiehall Street. For those whose pleasure is golf there are excellent links all around, among the most enjoyable being the new courses at Gleneagles, which are open to visitors. It is evident, therefore, that relaxations are not lacking for those who intend to take part in the deliberations of the British Medical Association when it meets in Glasgow at the close of next July. They can be assured, too, of a hearty Scottish welcome from their colleagues in the city and its neighbourhood.

THE RULES OF THE ROAD.

THE problems of the road raised by the astonishing increase of swift motor traffic are continuously in the public mind, both in town and country, but discussion on them is roused to greater intensity at irregular intervals by some serious accident or by the report of some one of the numerous committees which have been appointed from time to time to deal with different aspects of the subject. The last report is the third interim report of the Departmental Committee on Lights on Vehicles. The problem before it has been to define some method of avoiding dazzle, more particularly from head lights, while at the same time providing a safe driving light. "Dazzle" the committee defines as "such an intensity of light reaching the eye of an observer as to cause material interference with his normal vision under the conditions existing at the time of observation." What is a safe driving light from a driver's point of view depends, in the opinion of the majority of the committee, upon the speed of the vehicle, its effective braking capacity, and the existing atmospheric and road conditions. The representative on the Committee of the Cyclists' Touring Club, Mr. Howard Gritten, M.P., considers that the speed should depend on the light, not the light on the speed, the chief condition of safe driving being that a driver should be able to bring his vehicle to a standstill within the distance illuminated by his headlights. All the members of the Committee would apparently agree that a safe driving light varies with the class of vehicle, so that in this respect the report does not take us much further. With regard to dazzle, the committee, while considering its prevention under every condition and circumstance, at present unattainable consistently with a safe

driving light, makes certain recommendations: the principal are that the lower edge of the light should impinge upon the road not more than 50 feet from the face of the headlight, and that the upper limit should not exceed 4 feet from the ground. It recommends, however, that in addition to the main beam there should be a field of diffused light with a range of forward illumination on the road not exceeding 50 feet or less than 25 feet, and apparently unlimited upwards. How to attain these ends has not yet been determined, and more experiments are being made; but meanwhile the committee recommends that each headlight should be provided with frosted glass or some other device so that "it shall not give a range of forward illumination in excess of 150 feet at any point more than 4 feet above the ground." Such a headlight may give a reasonably soft illumination throughout its whole surface when viewed from a point more than 4 feet above the ground.

The publication of this report has provoked various writers to express their opinions, and one of them goes so far as to suggest that pedestrians should be compelled to indicate their presence by means of lamps or small reflecting discs slung over the shoulder, and adds that "all users of the road, pedestrians or otherwise, should be legally compelled to keep the rule of the road." Another writer has hinted a doubt as to what the rule of the road for pedestrians is; he observes that, since the time of Dr. Johnson, at all events, most people have recognized that pedestrians meeting should keep to the right. He wisely regards walking at night on the left side of a road without a side path as a risky procedure.

All the dangers of the road are intensified by darkness, but they exist during the day, and no section of the population is more interested than the medical in the formulation and enforcement of reasonable rules of the road. The Chief Constable of Hertfordshire recently addressed a letter to the county magistrates, and since it has been circulated by the Automobile Association it may, perhaps, be taken to express the hopes of motorists. It is an offence under the Motor Car Act to drive a car upon the road to the public danger, but the Chief Constable asserts that there is no law compelling a person to keep to any special side of the road, and that no man has any prescribed right to any particular part of the road. We suspect this to be an over-statement, for the rule of law seems to be that the pedestrian has the first right to the road, and that drivers must give way to him. Further, the immemorial rule in this country that drivers of vehicles of all sorts should keep to the left-hand side, at least when passing one another, has been recognized by the courts, as also the rule that in overtaking a driver should keep to the right. The courts, as the Chief Constable admits, will presume that a man who violates these rules has been negligent. But beyond this we cease to be on any sure ground.

Many years ago a member of the British Medical Association wrote a letter to the *Pall Mall Gazette* advocating the adoption of a single, simple rule of the road in all towns—a rule which he stated to be applicable to, and to provide rights and duties for, all road users, whether drivers or pedestrians. He suggested that in the roadway everybody should be made responsible for avoiding collision with vehicles or pedestrians on his right. A pedestrian stepping off the kerb would have the duty of seeing that no vehicle was approaching from the right; he should be entitled to be safeguarded from the risk of collision with a vehicle on his left. No driver should turn from one road into another across the bows of a vehicle on his right. To draw out from the kerb without looking to see that no vehicle is coming up from behind would be an offence. Cutting in from the near side as taxicab drivers so commonly do would be heavily punished in the event of a collision. It was contended that this rule was so simple that it could be impressed upon children and so safe that accidents would be reduced to a minimum. The suggestion to make a driver or pedestrian responsible for what is happening on his right has recently been supported by Viscount Knutsford in a letter to the *Times*, and is so far favoured by the Chief Constable of Hertfordshire that he says "vehicles approaching one another on roads of equal importance which cross should give way to the vehicles approaching from their right hand and pass behind."

We are informed that the recognition of such a rule was suggested to the Safety First Committee, but have been told that it was opposed by the Metropolitan Police; on what grounds we do not know. Nevertheless, it is possible that a demonstration of its effect might be of use in elucidating the problem of safety in towns; and we have yet to hear of circumstances to which it is inapplicable. When the letter to which we have referred was published the motor correspondent of the *Pall Mall Gazette*, searching for what he called a "limiting case," could only produce that of four vehicles approaching one another at cross roads. Observance of the rule, he suggested, would lead to a halt by all four cars. In towns this objection is to be met, and can only be met, by police control; in the country a driver should slacken at cross roads, and all good drivers do. If cross roads are blind a driver should go dead slow, and most good drivers do so, although the Chief Constable of Hertfordshire says that an attempt is being made to set up a rule that every driver of a vehicle debouching from a lesser road on to a greater has the onus upon him of taking every care and precaution against accident. Lord Knutsford argues that such a rule would be absurd on the ground that nobody knows which is a main road and which is not. His objection might, perhaps, be diminished if not removed were county councils and municipal authorities to take to marking side roads as such, with warning triangles fixed one every two hundred yards back, as is now sometimes done in the worst places.

THE MOLTENO INSTITUTE.

Opening Ceremony at Cambridge.

The opening of the Molteno Institute for Research in Parasitology took place on the afternoon of November 28th at Cambridge. The new institute is situated on the Downing site which adjoins Downing Street, being thus closely connected with the medical, physiological and other scientific schools of the University, and consists of eight large research rooms, one of the best features of which are the large windows with single panes which enable the maximum of lighting to be obtained. The research rooms all face towards the north, while the south side of the building contains the library, offices and various types of preparation rooms. The research rooms occupy the ground and first floors, while the top story is mainly devoted to a large museum in which the opening ceremony took place.

The chair was taken by the Vice-Chancellor of the University, Dr. Pearce, Master of Corpus, who opened the proceedings by welcoming Mr. and Mrs. Molteno, to whose generosity the building is due. He at the same time expressed the great regret of all present at the illness of Professor Nuttall, which prevented him from taking part in the opening of a building which was the culmination of many years of work and planning. It was to Professor Nuttall's eloquence that the generosity of Mr. and Mrs. Molteno had been directed to a result of such far-reaching importance to the prevention of disease. Congratulations had been received from General Smuts, High Commissioner of South Africa, the Director of the Pasteur Institute of Algiers and the Pasteur Institute in Paris, as represented by Drs. Roux, Calmette and Mesnil.

In the absence of Professor Nuttall Dr. Warburton welcomed in his name Professors Caullery and Langeron, representing the Pasteur Institute, and representatives from the War Office, Colonial Office, Ministry of Health, and many other public bodies. He referred to the history of the department—the Quick Professorship of Protozoology was formed in 1906, and Professor Nuttall was the first professor. The department had worked for fifteen years in temporary rooms in the medical school under considerable disadvantages. The protozoology of disease-producing protozoa had been the chief study of the department. He referred to the valuable library already installed in the building, consisting largely of Professor Nuttall's own large collection of books and journals dealing with parasitic diseases, supplemented by a valuable gift from Mrs. Churchill, given in memory of her brother, Walter Myers, an early worker in the department, who died of yellow fever while investigating that disease in South America. He claimed that the institute was unique, none other being entirely devoted to parasitology.

Mr. MOLTENO also expressed his great regret at the absence of Professor Nuttall, and congratulated him and all concerned on the splendid building which had been erected. From much experience in South Africa he had long realized the importance of the splendid work Professor Nuttall had been doing and the difficulties under which he worked. Many parts of Africa could not be occupied without solving the problem of the maintenance of the health of both men and animals. Development and the movement that this implied had rapidly spread disease, and this spread threatened to arrest progress. All parts of the empire had been benefited by the work of Nuttall and his pupils, who had gone to all parts of the empire. He was much gratified that Earl Buxton was present to open the institute, and he also welcomed Lord Pentland.

Earl BUXTON stated how glad he was to open the institute founded by his old friends Mr. and Mrs. Molteno. Their name was well known in South Africa, where Mr. Molteno's father, Sir J. Molteno, was the first Prime Minister of the Cape Province, and Mrs. Molteno was the daughter of Sir Donald Currie, who had helped so much in the development of the country. He especially admired their generosity in coming forward with a second supplementary gift when circumstances arose which made their first inadequate for fully carrying out the project of the institute. He joined in the deep regret at the absence of Professor Nuttall. His six years' experience as Governor-General of South Africa had brought home to him the dreadful ravages of diseases caused by parasitic insects. South Africa suffered not only from the plagues of Egypt but from many others in addition, which play a large part in the economy of the country. Many people in South Africa were full of gratitude for the work Professor Nuttall had done. He had, with very inadequate facilities, provided the stimulus for work all over the empire. Lord Buxton hoped that soon a time would be reached when the tick, the louse, and the mosquito would be relegated to the ranks of the unemployed. Many parasitic diseases were now acknowledged to be preventable, and the agent of disease was known; it was only a matter of time for their prevention and cure. He wished that another bacillus—that of public extravagance—could be discovered, so that those suffering from this disease should become cured. In South Africa and elsewhere, owing to modern facilities of communication and movement, many diseases once localized had now become continental, but he thought that, owing to modern discovery, the balance of progress was on the right side. Tropical countries were becoming habitable owing to medical research. New areas might thus be said to have been added to the British Empire. The conditions of the native population had also been enormously improved. During the war in many regions our men suffered more from insects than from bullets—for instance, in East Africa—and dysentery might have turned the scale in Gallipoli. In Egypt and Palestine also research could claim a considerable share in winning the war. A centre was required for training men in a broad and thorough way, so that they might be fully trained before going on scientific expeditions. Funds were necessary to keep such men at work for a sufficient time without financial worry. The new institute would attract men from all parts of the empire. He concluded by expressing the gratitude of all concerned to Mr. and Mrs. Molteno for their munificent gift, and then declared the institute open.

Professor CAULLERY then expressed the good wishes of the Institute Pasteur for the new institute. Parasitology was a subject that had become so large and assumed such importance that it was almost a special science. The institute would attract many workers and give them the opportunity of a full study of this science. He was delighted to find his former pupil, Dr. Keilin, established with Professor Nuttall and with others producing such valuable work—French zoologists that both nations had drawn close together in science as well as on the battlefield. Every occasion such as this was to be welcomed, as it made the association of the two nations closer.

Sir ARTHUR SHIPLEY then expressed the thanks of Cambridge to the visitors who had braved tedious and foggy journeys to attend the opening ceremony. He mentioned that Cambridge had a habit of growing, and that there was already the necessity for further endowment if such institutes, as well started, were to continue to develop.

England and Wales.

VICE-CHANCELLORSHIP OF BRISTOL UNIVERSITY.

THE announcement was made at the meeting of the University Court, held on November 18th, that Principal Thomas Loveday, of Hartley University College, Southampton, had accepted the invitation to become Vice-Chancellor of the University of Bristol. The Court decided to award the titular distinction of an Honorary Fellow of the University upon Sir Isambard Owen, M.D., who relinquished his position as the Vice-Chancellor at the end of last session. No more fitting recognition of the splendid services Sir Isambard Owen has rendered to the University of Bristol and the area it serves could have been devised than by making him the first Honorary Fellow of the University which he has so well established. The honour is not only the expression of the gratitude of the Court, the Council, and the Senate, but also of Convocation, where originated the desire to mark in this way the esteem in which Sir Isambard Owen is held.

MIDWIVES AND THE ADMINISTRATION OF OPIUM.

At the last meeting of the Surrey County Council, held at the County Hall, Kingston-upon-Thames, the following report of the Maternity and Child Welfare Committee was submitted:

Dangerous Drugs Act, 1920.

A circular letter has been received from the Ministry of Health, forwarding a copy of an Authority issued by the Secretary of State under the above Act enabling certified midwives who have notified to the local supervising authority their intention to practise to be in possession of, and to administer, preparations containing opium so far as is necessary for the practice of their profession or employment in such capacity, subject to the condition that they shall forthwith enter in a book to be kept for the sole purpose particulars of all supplies obtained, including the date, quantity, and name and address of the person from whom obtained. Your committee understand that the Authority in question was issued by the Secretary of State without prior consultation with the British Medical Association or the Society of Medical Officers of Health. Your committee are advised that it is both unnecessary and undesirable that midwives should be empowered to be in possession of and to administer preparations containing opium, and they have declined to issue any instructions to the midwives in the county on the subject.

This report was approved unanimously by the Surrey County Council.

LEEDS MEDICAL SCHOOL.

The thirty-eighth annual dinner of past and present students of the medical school of the University of Leeds was held on November 16th, with Dr. W. H. Maxwell Telling in the chair. The toast of "The Staff" was proposed by Mr. F. Clegg, a student, in an amusing speech, and Dr. Telling responded. He said that all was going well with the Leeds School of Medicine, and he did not think there was any school in which practical medicine was more efficiently taught. The teaching of the staff was a great deal better than it was when he first came to Leeds, but he indicated ways in which it might be improved. Leeds had been a school of the most brilliant surgery for a hundred years, and in recent years the teaching of medicine had made a great advance. Dr. T. Wardrop Griffith proposed the toast of "Past and Present Students," saying that he spoke with over thirty-eight years' experience of the school. On that day he had waited with Sir Berkeley Moynihan upon the University Council to urge them to appoint whole-time tutors on the medical and surgical sides. Mr. R. W. Lee responded.

VOLUNTARY HOSPITALS COMMITTEES.

The Voluntary Hospital Commission announces that Lord Cave, whose report on the voluntary hospitals led to the present scheme for assisting the hospitals, has agreed to serve on the Local Voluntary Hospital Committee for Surrey as one of the members nominated by the Hospital Commission. Considerable progress has now been made in the establishment of Local Voluntary Hospital Committees in various parts of the country, and steps were taken last week by the Commission to arrange for the preliminary meetings of the Local Committees for Cornwall, Derbyshire, Glasgow, Monmouthshire, Salop, Staffordshire, Surrey, Warwick, and Worcestershire.

Scotland.

FINANCIAL POSITION OF VOLUNTARY HOSPITALS IN SCOTLAND IN 1920.

SIR NAPIER BURNETT, M.D., Director of the Hospital Service to the Joint Council of the Order of St John and the British Red Cross Society, has presented a report on the financial position during 1920 of the voluntary hospitals in Scotland. It supplements previous reports on similar institutions in England and Wales and the reports of King Edward's Hospital Fund on the 112 London hospitals, and is a valuable contribution to the better understanding of the general subject. There are 94 voluntary hospitals in Scotland and Sir Napier Burnett deals with 78 of them, the remaining 16 being omitted either because they do not publish annual reports or because the reports were received too late for review. As these 16 hospitals provide only 375 out of a total of 6,981 available beds, it will be concluded that there is sufficient material for a complete and satisfactory review of the voluntary hospital system in Scotland. We are indebted to Sir JAMES GALLOWAY for permission to reproduce the following extracts from a memorandum on the report which he has prepared at the request of the Council of the Order of St. John and the British Red Cross Society:

Sir Napier Burnett's attention is specially directed to 78 hospitals and the details concerning them. These details form the basis of his report. Running through the report, there are clear indications showing the differences which must result in the finance and administration of large hospitals in contrast to the smaller institutions.

In order to simplify the study of these differences the 78 hospitals are divided into three classes: Class A, 18 hospitals with 100 or more available beds; Class B, 21 with 30 to 99 beds; Class C, 39 with under 30 beds. In Class A there are 5 hospitals with 2,933 beds attached to the medical schools of Scotland. The administration and finance of these five hospitals present special difficulties and special peculiarities; they are referred to repeatedly in the report as being in a special category.

The year 1920 was one of very great economic difficulty, and the report shows very clearly how hardly these difficulties have pressed on voluntary hospital administration. In Scotland the 78 hospitals already referred to show a total ordinary income of £793,988 and a total ordinary expenditure of £872,146; the excess of expenditure over income was thus £78,158. An unfavourable balance of this character, depressing though it is to members of hospitals councils, was expected. The only expression of relief and sympathy which I can offer to our colleagues in Scotland is that we are worse off in England, and still worse in London. Showing the relative differences of expenditure and the relative amount of deficit, reference is made to the 5 hospitals attached to medical schools; 4 of these 5 hospitals had an excess of ordinary expenditure over ordinary income of £47,763, while the fifth hospital had a surplus of £2,686, the net deficit of the 5 medical school hospitals was £45,077, or 57.67 per cent. of the deficit for the whole group of 18 large hospitals. On referring to Table "R," one of the series of exceedingly valuable statistical tables with which this report is furnished, it is shown that the hospital showing a surplus had an ordinary income per *occupied* bed of £152.40 with an ordinary expenditure of £149.33. The school hospitals have an expenditure necessarily higher than those without medical schools, and they show a relatively greater deficit. The public are well aware that these hospitals are not only places of healing for the sick, but the schools where doctors and nurses receive the chief part of their training. They are not only hospitals for the sick but training places for those who care for the sick. They are, therefore, invaluable as centres of medical education. It is a matter for astonishment that this education is given at so small a cost in excess of the expenditure in hospitals without medical schools. It seems clear that special efforts should be made by municipalities, or the State, and by private munificence, for the greater development of this essential form of higher education.

Special reference must be made to certain new sources of income, which begin to make an important showing in the accounts of voluntary hospitals—namely, income from or on behalf of patients. In Sir Napier Burnett's analysis this source of income fall under the following headings: Interest from investments, workmen's contributions, patients' contributions, payments from public services. During the year under review no less than 48.27 per cent. of the total ordinary income of these 78 hospitals came from this source. Till recently the proportion was much smaller, but within the last year or two the amount of the income from workmen's contributions, from associations, clubs, or guilds, and the amount from patients' contributions show a steady increase. The amount from public services is considerable in the meantime.

New sources of income for the voluntary hospitals are thus being exploited—in some cases with great success. The hospitals are no longer institutions entirely dependent on voluntary contributions and donations, as was the case until a very few years ago. With this change in the finances, followed as it must be by changes in the organization and administration of the voluntary hospitals, it is clear that there must also be a change in the position of the medical services which have hitherto been given freely to the hospitals as voluntary work on the part of the medical profession to a very great extent.

One of the most important benefits likely to follow from the publication of reports such as this is the adoption of a simplified system of hospital accounts which may be uniformly applied throughout the country. King Edward's Hospital Fund has already brought about this desirable change in London; it will not be long before this beneficial change occurs throughout England and Wales. From the report it appears that comparison between individual and otherwise comparable hospitals is exceedingly difficult in Scotland, owing not only to diverse systems of account keeping, but also owing to the varying of dates adopted for the fixing of the close of the financial year. From experience gained in London the hospitals themselves will gain great benefit from such a reform. It may be stated in a compendious manner that the want of the unified and comparable system of accounts causes the hospitals to level up their expenditure to the standard of the most rashly conducted and the most extravagant hospital, whereas the existence of such a system compels competition in efficiency with economy.

Sir Napier Burnett speaks with the authority of knowledge gained from Red Cross administration during the war when he emphasizes the good likely to arise by establishing a system of co-ordination for the treatment of all patients within county areas, and of finding some common ground for the reduction of expenditure along the lines of co-operative buying. The standardized and simplified system of account keeping would lend itself to economy of administration in this direction, as well as in many others.

Sir Napier Burnett's report will not fail to make hospital managers in Scotland anxious as to the future of their hospitals, and it will tend also to encourage efficiency of administration. In hospital management, especially under a voluntary system constant care and watchfulness must be exercised on the expenditure side of the account. The gathering in of money, the placing of such money to capital account, is a much more alluring and interesting task, but the hospital stands or falls by the zeal of those who guard the expenditure rather than by the energy of those who gather in the funds.

One of the most interesting points brought out in this report is the following remarkable fact: In the group of 78 hospitals, although a considerable excess of expenditure over income is shown for the year 1920, the total of receipts over expenditure actually amounted to £305,071. This excess, however, represents a considerable percentage of money that was specifically ear-marked, and thus not available for the hospitals to apply towards the ordinary maintenance expenditure except in the form of interest derived from invested funds. Such a result is the best testimony to those who with energy have devoted themselves to the collection and to the capitalization of the funds so collected for the use of the hospitals in Scotland. Notwithstanding, I would commend to the hospital councils the zeal of those who laboriously control the outgoing of their money. This state of affairs, showing this wonderful balance of total receipts, does, indeed, suggest a very generous measure of confidence on the part of the public of Scotland in their voluntary hospital system. Not even the most hardy supporter of a State hospital service is blind to the great advantages to the individual sufferer of the voluntary hospital system. To the majority of the people of this country the voluntary hospital system appeals as the plan best adapted to our social condition and our needs. There is no fear of its failing if capable administrators give their brains and time to the hospitals voluntarily, just as the medical staffs already do. What is wanted is businesslike administration of the funds in every way, but especially on the side of expenditure. Sir Napier Burnett's most helpful report shows how little removed the voluntary system was from being a success in Scotland, even in the bad year 1920.

Ireland.

ULSTER MEDICAL SOCIETY.

THE second meeting of the present session of the Ulster Medical Society was held in the Medical Institute, Belfast, on November 17th. The President, Dr. Robert Hall, occupied the chair. One Fellow and seventeen members were elected. Professor T. Walmsley, M.D., read a paper on prehistoric man, and pointed out that as there had been innumerable experiments in organic life from the beginning, and that only a few of these survived; so with man there had been many experiments, and many tentative forms evolved which eventually had come to nothing. He briefly described the various skulls and skeletons which had been found, and assigned them to their geological and glacial epochs. Such evidence of their social development as were available, was detailed, and the relation of some to the present races of man proved; others were evidently extinct types or species; they had branched off from the main stem, but had proved unfit; they were predecessors, not ancestors. In the brief discussion that ensued some questions were asked, and Professor Walmsley replied.

CANCER RESEARCH FUND.

The announcement was made last week that a Cancer Research Fund for Ireland is in process of inauguration in connexion with the City of Dublin Skin and Cancer Hospital, which was established in 1911. The Lord Lieutenant, Viscount Fitzalan, is patron of the fund. The chairman of the London Committee is Mr. J. MacVeagh, M.P., and the honorary treasurer is Dr. Frederick Spicer.

New South Wales.

PROPOSED HOSPITAL FOR CANCER PATIENTS.

THE Home for Incurables at Ryde, near Sydney, has provided for many years past for a large number of cases of incurable disease, but has not taken in any cases of cancer. The large number of applications from patients suffering from this disease which are continually being received has impressed the committee so much that at the last annual meeting of the charity an appeal was made to the public for funds to establish a special hospital for this class of patient. To this end an appeal for £25,000, an amount which it was stated was required to carry out this project, was launched, and was warmly supported by His Excellency the Governor, and the Chief Justice, Sir William Cullen, the President of the Institution. His Excellency pointed out that the proposed extension of the home to accommodate cancer patients must commend itself to every one. The home depended solely on voluntary subscriptions for its income, and the income and expenditure were almost evenly balanced at about £9,000 a year; when it is stated that there are 90 beds in the home it will be seen that it is managed very economically. Sir William Cullen supported the proposal and pointed out that until medical science found some remedy for this disease it would be the duty of the public to provide a home for the unfortunate sufferers from cancer.

HEALTH WEEK.

"Health Week," which has been organized by a number of bodies directly concerned with public health matters, has been successfully carried through. On the Sunday a number of addresses on health questions were given in the churches by medical men, and throughout the week various lectures and addresses were delivered to different gatherings. One of the most effective means of creating a sense of individual responsibility in health matters is the display in the windows of a number of the large shops of a comprehensive range of exhibits. In one of the largest establishments in the city there was a complete exhibit from Queensland by Dr. Sawyer of the work of the hookworm campaign which is being carried on in that State. Another shop window made a display of curative industries for returned soldiers. With the approval of the Education Department teachers in the State schools are giving special lessons on health subjects. Another noteworthy feature of the week's activities has been the specially prepared hygienic lunches at the city restaurants. These have consisted of whole wheatmeal flour in some shape or form, lettuce, tomatoes, cucumbers, etc., various rice croquettes, macaroni, and fruit, with milk and soda or barley water as beverages.

Some idea of the extent of the organization of this health week can be gained by the number of addresses and lectures given. Thus Brigadier-General R. E. Roth gave a series of lunch-hour lectures and demonstrations at the Town Hall on swimming, health and life saving; Dr. Harvey Sutton, the chief medical officer of the Education Department, addressed an audience of nearly 3,000 teachers and students of the Technical College on "How to keep fit"; Professor Harrison, formerly assistant director of sanitation in Mesopotamia, lectured on "Flies and disease"; Dr. J. S. Purdy gave an address on health in relation to building, at the Master Builders' Rooms; Professor Wilkinson, professor of architecture in the University of Sydney, lectured on material environment and health, at the Women's Service Club, and Dr. Harvey Sutton lectured on health and efficiency to the girl students at the Technical College.

Correspondence.

RESEARCH DEFENCE.

SIR,—I much want to interest a wider public in the Research Defence Society, and to induce more people to become members of it. What is it? Surely, Research needs no defence? That is the sort of answer that one gets. It is true that Research needs no defence. But Researchers need defence, because there is a set of people who are for ever preaching that Researchers are callous and cruel, and that experiments on animals are not only painful but utterly useless. It is the aim of this society, of which I happen to be chairman, to answer and refute these attacks on Researchers and their work. It costs only 10s. a year to be a member of the society, or 5s. to be an associate member.

After some thirty years of work in connexion with hospitals, I have found that all the general public cares about is the curing of diseases which have actually got hold of them. It is very difficult to interest the general public in preventive medicine. To your readers I need not insist on the fact that preventive medicine can make no progress without research, and that many branches of research involve experiments on animals.

The public is always ready to believe ill of anyone, and these experiments are described by "antivivisectionists" in language as forcible as untrue. To prejudice ignorant people against the work of our men and women of science, antivivisectors impudently say that nothing has come of these experiments; that germs do not cause diseases; that Pasteur and Lister were all wrong and very cruel; that diphtheria antitoxin is useless; that the protective treatments against typhoid, paratyphoid, tetanus, and rabies are useless; that vaccination against small-pox is useless; that Malta fever was not due to the drinking of the goat's milk; that the protective treatment of sheep and cattle against anthrax is useless; and so on and so forth. I had almost written "so froth." This sort of talk is not only calculated to rouse hatred against science and practice; it is a national danger and a general nuisance.

It was nobody's business, till we started the Research Defence Society in 1908, to answer antivivisectors. We have already brought about a better understanding of the facts of the case. But antivivisection has wealth on its side, and, so long as it has money to spend, we cannot expect it to leave off. One hope is that as their various societies quarrel so much amongst themselves they may end by cutting each other's throats.

I appeal confidently to your readers to become members or associate-members of our society.—I am, etc.,

KNUTSFORD.

Research Defence Society,
11, Chandos Street, Cavendish Square,
London, W.1, Nov. 26th.

CLAYDEN *V.* WOOD-HILL.

SIR,—The facts of the case of Clayden *v.* Wood-Hill, recently decided at the Suffolk Assizes, a report of which appeared in your issue of November 26th, when a verdict of £750 damages was given against a medical man for alleged negligence in the treatment of a fractured femur, should be studied by all medical practitioners.

The plaintiff was thrown out of a trap and sustained a fracture of the upper third of the right femur. Two days later she was moved to the Beccles Cottage Hospital, in Suffolk, where Dr. Wood-Hill of Beccles attended her. The fragments united, and in eight weeks she returned home to Hertfordshire, with strict instructions from Dr. Wood-Hill that no weight was to be borne by the limb without the permission of her family doctor. A week later, when standing in her room at home, she felt the limb give way and she fell on to a sofa.

Abundant evidence was produced at the trial that as regards splinting, extension, and position of the limb, the fracture was treated in accordance with modern methods while the plaintiff was an inmate of the Beccles Cottage Hospital.

The verdict of the jury largely turned on the question as to whether, at the second accident nine weeks after the first, a giving way of the previously united fragments took place. By very adroitly drawing from one item in the medical evidence bearing on this question an inference which, from a medical point of view, was entirely unjustifiable, counsel for the plaintiff induced the jury to bring in a verdict for the plaintiff with damages as stated.

Many of those who watched the case throughout its course are convinced that a grave miscarriage of justice has taken place, and for this reason a fund has been started to reimburse Dr. Wood-Hill in the very heavy expenses incurred by him, which, we are informed, will amount, with costs, to about £1,600. Naturally the question of appeal has been very carefully considered, and Dr. Wood-Hill has been advised against this course by both his counsel and his solicitor.

It is true that at the time of the trial Dr. Wood-Hill was not a member of one of the medical defence societies, but this, although showing a lack of foresight on his part, is no reason for refusing to help him in this emergency. The fund will also serve as a token of the respect and esteem in which Dr. Wood-Hill is held in Beccles and the neighbourhood.

The following subscriptions have already been promised:

	£	s.	d.
Mr. Hugh P. Helsham, Beccles ...	26	5	0
Mr. John H. Allden, Beccles	20	0	0
Mr. Christopher T. Helsham, Beccles	10	10	0
Sir Robert Jones, Liverpool	10	10	0
Mr. George E. Gask, London ...	10	10	0
Mr. R. C. Elmslie, London... ...	10	10	0
Dr. Samuel J. Barton, Norwich ...	10	10	0
Dr. F. W. Burton-Fanning, Norwich...	10	10	0
Sir Hamilton Ballance, Norwich ...	10	10	0
Dr. Wilson Tyson, Lowestoft ...	10	10	0
Sir John Lynn-Thomas, Cardiff ...	10	0	0
Dr. H. Muir Evans, Lowestoft ...	5	5	0
Dr. C. B. Ticehurst, Lowestoft ...	5	5	0
Dr. D. W. Boswell, Lowestoft ...	5	5	0
Mr. J. C. Mead, Lowestoft	5	5	0
Mr. S. H. Burton, Norwich	5	5	0
Mr. Donald D. Day, Norwich ...	5	5	0
Dr. Sydney H. Long, Norwich ...	5	5	0
Mr. A. J. Blaxland, Norwich... ...	5	5	0
Dr. R. W. Mullock, Southwold ...	5	5	0
Dr. D. H. Hutchinson, Lowestoft ...	3	3	0
Mr. E. W. Everett, Norwich	2	2	0
Dr. H. J. Starling, Norwich	2	2	0
Mr. S. F. Smith, Beccles	2	2	0

Subscriptions should be sent to Sir Hamilton Ballance, All Saints Green, Norwich, and will be acknowledged from time to time in the medical press,—We are, etc.,

ROBERT JONES, Liverpool.
GEORGE E. GASK, London.
R. C. ELMSLIE, London.
JOHN LYNN-THOMAS, Cardiff.
HAMILTON A. BALLANCE, Norwich.
WILSON TYSON, Lowestoft.

Norwich, Nov., 26th.

SIR,—After reading the account of the above case in yesterday's JOURNAL, also Mr. R. C. Elmslie's letter, surely two thoughts should occur to most of us?

1. We should assure Dr. Wood-Hill of our sympathy with him.

2. We of this generation should consider it our bounden duty, as a profession, to see to it that such a judgement is not allowed to pass unchallenged, both in our own interests and in the interests of those that come after us.

It therefore follows that subscriptions should be raised to defray all the expenses of an appeal. How can this best be done?—I am, etc.,

Cranborne, Salisbury, Nov. 27th. CHAS J. GIRLING.

SIR,—The case of Clayden *v.* Dr. Wood-Hill, as reported in the BRITISH MEDICAL JOURNAL of November 26th, makes one wonder if one can really afford to practise medicine and surgery—if after employing all the methods one was taught as a student and doing one's best for a patient (as Dr. Wood-Hill evidently was), to be suddenly savagely penalized to the extent of nearly £1,000 is enough to make any humble general practitioner pause before he tackles a difficult fracture. It is evident that if this verdict is allowed to stand the position of the medical practitioner becomes one of great risk and insecurity, as the whole question of what constitutes malpraxis is changed from what it was before. This being so, is not this a case which should be fought tooth and nail by the Association? If a subscription list were opened I am sure many would avail themselves of the opportunity of rectifying a serious miscarriage of justice.—I am, etc.,

Burwash, Sussex, Nov. 27th. A. W. S. CURTIES.

SIR,—I trust our Association and the profession at large do not mean to take the decision in this case "lying down." That such a verdict in face of the weight of evidence can be considered as final is unthinkable. No practitioner is safe now, it would seem, from the risk of ruin after he has done everything he possibly could or in reason be expected to do for his patient. It is a very serious position for every one of us to consider.

I have always understood that all that was required of a practitioner—apart from the expert—was that he should have shown all ordinary skill and competence. Dr. Wood-Hill, in my view, did so, and possibly more; and we have the evidence of an expert in Sir Hamilton Ballance, who said Dr. Wood-Hill's treatment was just what he himself would have done. What can judge or jury want beyond this?

Mr. Elmslie's letter is of the highest importance as showing that both judge and jury seemed to have ignored or imperfectly understood some parts of his evidence which had an important bearing in favour of the defendant.

I hope an appeal will be lodged, and that it will have the whole weight of the Association and the profession at large behind it, and, further, that a fund be opened at once to meet the expense.—I am, etc.,

Felton, Northumberland, Nov. 28th. ROBT. A. WELSH.

PULMONARY CIRCULATION.

SIR,—In the JOURNAL of November 12th Dr. S. W. F. Underhill gives the results of tying the left pulmonary artery, which, he states, has no effect on the aortic pressure. In these experiments the work of Lichtheim is repeated with similar results. Landgraf in 1892 showed quite clearly that the apparent absence of change in the aortic pressure was due to the artificial respiration, and this view is supported by Leonard Hill in Schafer's *Textbook of Physiology*. The recent work of Sharpey Schafer shows what an important part alveolar pressure plays in the causation of respiratory variations in the blood pressure. Similar objections may be put forward regarding like experiments of Bainbridge and Underhill in the *Proceedings of the Physiological Society* of March of this year.

The experiments of Underhill, if carefully analysed, are far from convincing, indeed it is difficult to see how he arrives at his results from them. It may be that his examples are unfortunately chosen. In A. and B. there is a definite fall in aortic pressure after ligation of the left pulmonary artery. That this is obtained during artificial

respiration is all the more striking as such respiration would tend to mask the effect, as pointed out by Hill in regard to Lichtheim's experiments. In B. also, the fact that a minute output of 378 c.cm. does not raise the blood presure so much as an output of 288 c.cm. may be taken to indicate a variable factor which renders the experiment fallacious.

The anaesthesia is a weak point in all the experiments, and probably could be best avoided by the use of decerebrate preparations. It is difficult to see how a constant level of anaesthesia was guaranteed when enormous changes were made in the ventilation, and especially when a change was made from artificial to natural respiration. For example, in F 2, where the aortic pressure actually rose after tying the left pulmonary artery, circulatory depression (72 mm.) at the beginning of the experiment is suggested, but as urethane and atropine were given also, several factors have to be considered. On comparing the results of Bainbridge and Underhill given in March with the results of the present apparently similar experiments, there are some striking differences, for which no reason is given, while in drawing conclusions the work of Krogh and Shaw Dunn could with advantage have been considered

I do not wish to dispute the findings of Dr. Underhill unduly, as they are evidence of much work, but I do think there are several points worthy of further consideration and explanation before the results can be accepted.—I am, etc.,

R. J. S. McDOWALL.

Physiological Laboratory,
University of Leeds, Nov. 16th.

DESTRUCTION OF LICE ON HAIR-CLAD AREAS.

SIR,—As an aural surgeon who sees a considerable number of out-patients in a slum area and as a certifying surgeon I have an opportunity of seeing some 2,000 more or less lousy heads per annum, mostly in children at school or in "young persons" coming straight from school to factory life.

I was accordingly very interested in Mr. A. Bacot's article headed' 'Wood tar oils for the destruction of lice on hair-clad areas" in your issue of November 19th, the more so as I had myself attempted some experiments last year with a view to finding a treatment for this condition that would be "cheap, safe and efficient."

I was disappointed to find absolutely no mention of the one essential to safety in any mixture that is to be prescribed for home use—namely, non-inflammability.

When one considers the ingrained carelessness of the class for whom such treatment is usually required, and the almost universal practice of girls drying their hair at the fire, one must refuse to prescribe a dangerous mixture such as olive oil and paraffin for *home* use, though it is very effective for institutional use. But I for one would not consider that I had been a public benefactor if, in the course of five years I had succeeded in getting 10,000 girls to cleanse their hair, and in that time one girl lost her life through carrying out my prescription.

Any mixture which contains (*a*) a substance which will kill the louse, which is not difficult, as the paraffin does in the above, and (*b*) a heavy oil which will block up the blow-hole of the nit and so prevent him from getting out of his capsule, a feat which he performs by means of air pressure—a true *vis a tergo*—will be effective. It would probably be in vain to look for a substance which would dissolve the cement without injuring the hair, but a fine tooth comb and goodwill work wonders.

What is required is to discover such a mixture which will be cheap, non-inflammable, non-injurious to the skin and hair, and fairly easily removable from the hair afterwards. This should not be impossible and one hopes that Mr. Bacot or some of our laboratory workers will tackle it seriously with a perception of the real problems involved.—I am, etc.,

E. S. BURT HAMILTON, M.B., F.R.C.S.Ed.

Manchester, Nov. 21st.

IMMEDIATE TREATMENT OF DIPHTHERIA.

SIR,—In view of the increase of cases of diphtheria in London, it might be of interest to your readers to know the results of treatment of this disease in two of the largest settlements in connexion with Dr. Barnardo's Homes—namely, the Boys' Garden City, Woodford Bridge, and the Girls' Village Home, Barkingside. There are over 2,000 children in residence, and the population is constantly changing.

In the past seven years there have been 205 cases of which I have record, with two deaths, under 1 per cent. During the past two years 96 cases, with no death. This good result I attribute mainly to two factors: (1) The cases are seen early, usually on the first day, and are immediately taken into hospital under skilled nursing. (2) Any case of sore throat which is sufficiently suspicious as to call for a swab being taken for bacteriological examination is immediately given an intramuscular dose of antitoxin of 2,000 to 6,000 units, according to its apparent severity. Thus by the time the report is known the exudate often shows signs of abating. If the result is positive, valuable time is gained; if negative, no harm has been done.—I am, etc.,

G. GUSHUE-TAYLOR, M.B., B.S., F.R.C.S.

Barkingside, Essex, Nov. 21st.

MEDICINE IN BAGHDAD.

SIR,—I notice in your issue of October 1st, 1921, an annotation on the work of the Baghdad Medical Society, wherein it is stated that this body "has been converted into the Baghdad Division of the Mesopotamian Branch of the British Medical Association."

This is a misapprehension. The two societies have and will have an entirely separate existence.—I am, etc.,

GORDON SPENCER, B.A., M.D.,
Honorary Secretary, Mesopotamian Branch,
British Medical Association.

New General Hospital, Baghdad,
Nov. 5th.

Obituary.

SIR SYDNEY BEAUCHAMP, M.B., B.CH.CANTAB.

WE announced briefly last week the tragic death of Sir Sydney Beauchamp, as the result of a street accident in London on the night of November 22nd. While walking with a friend he was knocked down by a motor omnibus in Pall Mall, and died soon afterwards in Charing Cross Hospital. It was only last year that he was knighted in recognition of his services as resident medical officer with the British Delegation during the Peace Conference in Paris. He had practised with very great success for many years in William Street, Lowndes Square.

Sydney Beauchamp was born in 1861, the son of the late Henry H. Beauchamp of Bexley, Kent. He began his medical studies at Gonville and Caius College, Cambridge, graduating B.A. in the Natural Sciences Tripos in 1887. He then went to St. Bartholomew's Hospital, and two years later obtained the M.R.C.S. and L.R.C.P. diplomas. He took the M.B. and B.Ch. degrees in 1890, and became M.A. in 1896. During his early days of practice he acted as clinical assistant in the Electrical Department at St. Bartholomew's.

Sydney Beauchamp's personal qualities very soon began to bring him success in what is still called "West End" general practice. He was an indefatigable worker, methodical and thorough, with the gift of inspiring confidence in his patients and their friends. He was a man of the world, equal to every occasion professional or social, with a singularly tactful and charming manner. The art of handling men, women and children came to him by nature and was perfected by long experience. This quality of entering into the minds and feelings of his patients is indicated by his friends and colleagues, whose appreciations we print below.

During the war Dr. Beauchamp acted as medical officer of the Wrest Park Military Hospital, and gave the benefit of his large obstetrical experience to the Officers' Families Fund, to whose lying-in hospital he was physician. He married in 1891 Edith, daughter of Henry Morton Sharp. The funeral took place on November 25th, the first part of the service being held at Holy Trinity Church, Sloane Street.

Lord DAWSON OF PENN writes:

Sydney Beauchamp held a place of his own in the practice of medicine. For more than thirty years he laboured unceasingly, forgetful of self and intent that his many patients should have the best he could give and obtain for them. To this end he shaped his life. His holidays were few, his working days were long and began

before a large part of the world was astir. As a doctor he had the gift of grasping the essentials of a case, and although suffering, whatever its cause, inspired him to help, he quickly perceived if it was only of transient importance or, on the other hand, foreboded serious illness. Though his intuition was quick to appreciate symptoms and appraise their value in each individual patient, he at the same time availed himself of every scientific method which would further sound diagnosis and treatment.

Beauchamp was especially skilled in obstetrics, and his increasing reputation and occupation in this branch of work had led him to give up general practice, and he had, so to speak, begun a new career, which was pre-eminently suited to his abilities and tastes. Here he was helped by his devotion to children, who, on their part, always sought him out with that sure instinct for those worthy of admission to their world. Among the important chapters of his life were the many months he worked in Paris as physician to the British Delegation at the Peace Conference, where he was not only the doctor but the trusted friend of a large and varied community, and it was after this that his work was recognized by the bestowal of a knighthood.

Of Beauchamp's personal qualities it is a privilege to speak. His character was one of singular beauty; his tender sympathy enabled him at once to understand the difficulties and struggles of many who sought his aid. To be his patient was to be his friend; he was never heard to say an unkind word to anyone or of anyone; worldly advantage he accounted but little; to him the need was sufficient inspiration for service; his pervading cheerfulness was not a veil for a light-hearted carelessness, but was born of faith and courage. For the many from far and wide who to-day feel bereft Sydney Beauchamp—his work, his understanding heart, his wise counsel, and his ever-present friendship—will be an abiding memory. His labour of love has ended but our love for him will endure.

WE are indebted to Dr. G. F. STILL for the following personal tribute:

The world is the poorer for the loss of Sir Sydney Beauchamp. The dreadful tragedy that took him from us on Tuesday last has brought sorrow to many a family, for he was not merely the professional adviser, he was a friend, and a friend beloved, to all his patients.

It is thirty-six years ago since I first met him as an undergraduate of Caius College, Cambridge, and in those days he had the same winning charm that drew people to him in later life. Some of us at Caius used to call him "the lovely B.," and lovely he was in the sense of being lovable and loving. I can fancy that, like Abou Ben Adhem, he might have said to "the angel writing in a book of gold":

> "I pray thee, then,
> Write me as one that loves his fellow men."

He was one of those rare souls that find a joy and inspiration in "the common round, the daily task." Only a few days before he died I called upon him one morning when he was just getting up after having been at work most of that night and all the previous night, and to my sympathy he replied, "I love my work, it is simply a joy to me." To his patients he brought comfort and confidence; he was of those who "passing through the Valley of Weeping make it a place of springs," and grievously will his patients miss him.

In his earlier days he was engaged in general practice, but his leaning had always been to obstetrics, and latterly he had devoted himself more and more exclusively to this branch of his profession; but whether in the anxieties of obstetric work or in the heavy labours of a war hospital, or in the peculiar responsibilities of his position at the Peace Conference in Paris, Beauchamp never spared himself; he was a man who gave himself not grudgingly but joyously for others—and surely this is life's ideal.

"E. C. B." writes: As one whose friendship with Beauchamp dates back some twenty-five years may I be permitted to add a word of tribute to his memory? Beauchamp started practice in South Kensington thirty years ago, and through his professional ability, charming personality, and great love for his profession, he built up a very large general practice. It was only during the past few years that he gave up general practice and confined himself to the branch of the profession in which he took most interest, namely, obstetrics and gynaecology; in this he was very successful owing entirely to his great experience, sound judgement and technique; his gentleness in the application and use of forceps was extraordinary—an example which might well be followed and imitated by others. His kindness and hospitality to young and struggling practitioners was proverbial; the writer received many such kindnesses during his long friendship for which he will always feel grateful. Beauchamp was ever ready to lend a helping hand at some difficult medical or maternity case, whether his services would be remunerated or not. To him it was immaterial; his only object was to help a colleague and to alleviate distress. The profession has lost a member whom it can ill afford to spare, his professional friends a lovable and loyal colleague, and his patients a sound and capable practitioner. Jealousy was unknown to him. His sympathetic nature, cheering disposition and charm of manner endeared him to all patients, who will sadly miss him.

G. S. ELLISTON, C.B., M.R.C.S., V.D.,
Formerly Medical Officer of Health, Ipswich.

WE much regret to announce the death of Colonel George Sampson Elliston, C.B., which took place at his residence in Felixstowe, on November 20th. Born in 1844 at Ipswich, the son of a well-known physician, Dr. William Elliston, he received his medical education at Guy's Hospital. He qualified with the diplomas of M.R.C.S.Eng. and L.S.A. in 1866, and after resident appointments at the Royal Free Hospital and the East Suffolk Hospital he commenced practice at Ipswich. In 1875 he was appointed the first medical officer of health for the county borough and port of Ipswich, and later appointments included that of medical officer of the Isolation Hospital and of the Samford Hundred. He held office for the long period of thirty-two years, and under his wise guidance great improvements were effected in that time in the public health arrangements in Ipswich. Dr. Elliston became a volunteer in 1862, and served with unflagging enthusiasm until the age limit necessitated his retirement in 1912. He was a member of the War Office Committee responsible for the scheme of the Royal Army Medical Corps (T.F.), and he was appointed the first A.D.M.S. of the East Anglian Division of the Territorial Army. He was created C.B. in 1911, and was one of the first recipients of the Volunteer Decoration. On his retirement he went to live at Felixstowe, where he became a member of the Urban District Council.

Dr. George Elliston was an old member of the British Medical Association, and in 1900 was vice-president of the Section of Navy, Army, and Ambulance at the Annual Meeting. He was a brother of Dr. W. A. Elliston, who was President of the Association when it met at Ipswich in 1900, and uncle of the late Mr. Guy Elliston, for sixteen years Financial Secretary and Business Manager of the Association. The funeral took place on November 24th in the presence of a very large gathering of friends. The British Medical Association was represented by Mr. P. L. Giuseppi, honorary secretary of the Suffolk Branch.

Colonel E. C. FREEMAN, C.M.G., writes: The late Colonel George Sampson Elliston, C.B., was one of those in whom the military spirit is strong, although their lot is cast in civilian life. Elliston joined the old Volunteer Force even before he began his medical studentship at Guy's. Later on he took an active part in the formation of the brigade bearer companies which marked the first effort of the Force towards medical efficiency. He was appointed A.D.M.S. of the East Anglian Division at the inception of the Territorial Force and I joined him as his D.A.D.M.S. in 1907. The situation was then somewhat problematical, as we had but few medical officers and only some twenty men (the wreckage of brigade bearer companies) wherewith to form four field ambulances and the regimental medical service of a complete division and mounted brigade. However, Elliston's enthusiasm, hard work, and bonhomie triumphed, and very soon the infant cadres began to show healthy growth. He had an intimate knowledge of men and matters in East Anglia, and always knew the right men to get hold of and where they

were to be found. He devoted himself to the work and was most regular in his attendance both in office and in camp, and, although an enthusiast, was most delightful to work under, full of old-fashioned courtesy and kindness. He was broadminded and welcomed new developments, such as the formation of the cadre of a general hospital, the formation of a training school for R.A.M.C., the addition of a D.A.D.M.S. Sanitation. He also took great interest in the training of the V.A. detachments in the divisional area, so that they could be relied on to work in concert with the R.A.M.C. in case of emergency. One is glad to think that he lived to see the organization which he had initiated successfully pass the test of actual war in Gallipoli, Egypt, and Palestine as the R.A.M.C.T. of the 54th Division. Elliston was awarded the C.B. on retirement; he was also a Knight of Grace of the Order of St. John of Jerusalem—a well-deserved recognition of the sterling work he did for St. John Ambulance in East Anglia extending over a period of many years. He has died honoured and at a ripe age, and we have lost a good friend, a good patriot, a good organizer, and one in whom the sense of duty was always supreme.

We are indebted to Dr. MICHAEL BEVERLEY for the following appreciation: To know George Elliston was to love him. These few words express what we who were thus privileged felt on reading of his death. During the greater part of my professional life I was intimately associated with the two brothers William and George Elliston of Ipswich. I therefore readily comply with the request of his family to write a short appreciation of the one who has now joined his brother in the "Great Beyond." Little, however, can be added to the words with which I commenced. George Elliston was highly esteemed by all who were brought into contact with him, either professionally or otherwise. Adhering strictly to the etiquette and dignity of his profession, especially in his public work, which often demanded great tact and judgement, he was able to accomplish great things in improving the sanitation of the districts committed to his charge, and although he implicitly adhered to the axiom, "Sanitas, sanitas, omnia sanitas," he never allowed the utopian schemes of faddists to influence his judgement. His long connexion with the St. John Ambulance Association was to him a labour of love. How much appreciated that devoted work was, the well deserved honours he received abundantly testify. It was once my good fortune to witness a practical illustration of this: Chancing to be passing near the Horse Guards on the occasion of one of the Victorian celebrations—the crowds were enormous, and many were taken ill—I recognized the tall figure of my friend in the midst of it with his stretchers and ambulances; through his personal help and superintendence it was wonderful to see how quickly the fainting and incapable were removed and order restored before the approach of the Royal cortège; it made a great impression on me at the time. An English gentleman of the true type, his old-world courtesy and natural bonhomie, made George Elliston a *persona grata*—indeed, *gratissima*—in the circle in which he moved; friends he had in legion, enemies none.

SIR JOSEPH REDMOND, M.D.,

Physician to the Mater Misericordiae Hospital, Dublin.

THE death of Sir Joseph Redmond, M.D., F.R.C.P.I., took place at his residence in Dublin on November 26th. For the past year he had not enjoyed his usual health, and latterly suffered from heart trouble with the more common complications. Sir Joseph Redmond was the son of the late Mr. Denis Redmond, Sandford, Ranelagh, Dublin. He received his early education at the Jesuit School, Belvedere College, Dublin. He became a Licentiate of the Royal College of Physicians in Dublin in 1878; he was elected a Fellow in 1884, and was President from 1906 to 1908. He was senior physician, Mater Misericordiae Hospital, Dublin; consulting physician, National Hospital and Coombe Hospital, Dublin. He was also a Fellow of the Royal Academy of Medicine in Ireland, and was an ex-president of the Section of State Medicine. He was censor and examiner of the Royal College of Physicians and the Conjoint Board. He read many papers at the meetings of the Medical Section of the Royal Academy of Medicine. Sir Joseph Redmond was very popular amongst the members of his profession, and was a highly esteemed citizen of Dublin.

WILLIAM STOKER, F.R.C.S.I.,

Surgeon to Jervis Street Hospital, Dublin.

THE death of Mr. William Stoker, F.R.C.S.I., which occurred recently at his residence in Dublin, caused much regret amongst the profession in Dublin and a large circle of friends. Mr. Stoker was born in Dublin seventy-eight years ago and came of a family which has been very long connected with the medical profession, to which it gave many well known and distinguished members. He graduated in arts in the University of Dublin and was admitted in 1873 a Fellow of the Royal College of Surgeons in Ireland. He was only a short time qualified when he was appointed surgeon to Jervis Street Hospital, a post he held down to the time of his death. He was a lecturer in the Old Ledwich School of Medicine, and when that body was taken over by the medical school of the Royal College of Surgeons he was appointed Professor of Surgery in that College. He was for many years a member of the Council of the Royal College of Surgeons in Ireland and never failed in the annual elections to be returned amongst the first in the list. Amongst many other offices he was examiner in surgery under the conjoint schemes of the Royal Colleges of Surgeons and Physicians, Ireland, and examiner in forensic medicine in the old Queen's University. He was a man of fine physique and enjoyed such very good health up to the time of his death that he looked a much younger man than his age. In his student and younger days he was devoted to athletics, particularly to rowing and cricket.

WE regret to record the death of Dr. WILLIAM MUNN HUNTER, which took place on November 10th at Eckington, near Sheffield, at the advanced age of 94. Dr. Hunter was educated at the University of Glasgow, where he graduated M.D. and C.M. in 1862. After a short period of medical practice in Paisley, with his brother, the late Dr. J. B. Hunter, he went to Eckington, where he built up a large general practice, and was highly esteemed by all classes of the people, retiring from practice only a few years ago. He was an old member of the British Medical Association. His wife predeceased him some thirty years ago, but he is survived by nine of his eleven children.

Universities and Colleges.

UNIVERSITY OF OXFORD.

Scholarships.

A WAR Memorial Scholarship of £100 per annum is offered for competition at University College on December 6th, and is confined to intending medical students.

Scholarships in Natural Science, most of which are open to intending medical students, are offered at University, Balliol, Oriel, Lincoln, Magdalen, Christ Church, and St. John's, examining in combination on December 6th, and at Jesus College on December 17th.

Appointment of Examiners in Medicine.

The following appointments are announced:—In Organic Chemistry: Edward Hope, M.A., Fellow of Magdalen College. In Human Anatomy: Professor Arthur Thomson, M.A., Student of Christ Church. In Human Physiology: Martin W. Flack, B.M., M.A., University College. In Materia Medica and Pharmacology: Reginald St. A. Heathcote, D.M., New College. In Pathology: Professor Henry Roy Dean, D.M., New College. In Forensic Medicine and Public Health: Francis J. Stevens, D.M., Exeter College. In Medicine: Harold Batty Shaw, M.D.Lond. In Surgery: Sir William Thorburn, M.D.Lond. In Obstetrics and Gynaecology: George H. A. Comyns Berkeley, M.B.Cantab.

UNIVERSITY OF GLASGOW.

THE University Court announces in our advertisement columns that forms of application for permission to commence the study of medicine in April, 1922, may now be obtained from the Registrar of the University, to whom they must be returned not later than February 13th, 1922.

LONDON INTER-COLLEGIATE SCHOLARSHIPS BOARD.

FIFTEEN medical entrance scholarships and exhibitions, of an aggregate total value of about £1,300, tenable in the Faculty of Medical Sciences of University College and King's College, and in the medical schools of Westminster Hospital, King's College Hospital, University College Hospital, the London (Royal Free Hospital) School of Medicine for Women, and the London Hospital, will be offered for competition on Tuesday, June 27th, 1922. Full particulars and entry forms may be obtained from the Secretary of the Board, S. C. Ranner, M.A., the Medical School, King's College Hospital, Denmark Hill, London, S.E.5.

Medical News.

THE next social evening of the Royal Society of Medicine will take place on Wednesday next, December 7th, and not as stated last week, on November 30th. At 8 p.m. the President and Lady Bland-Sutton will hold a reception, and at 9 p.m. Sir Berkeley Moynihan will deliver a short address on medicine in art, which will be illustrated.

AMONG the honours conferred in connexion with the inauguration of the new system of government in Malta was the knighthood conferred upon Sir Philippo Sciberras, M.D.Malta. The first Minister of Health in the new government of Malta is Professor Mifsud, M.D.Malta.

A MEETING of the subscribers to the War Emergency Fund will be held on Wednesday, December 7th, at 5 p.m., in the rooms of the Medical Society of London at 11, Chandos Street, Cavendish Square, W.1, when a report upon the work of the fund since its foundation will be presented.

THE Council of Epsom College will shortly award a St. Anne's Home Scholarship of £42 a year to the orphan daughter of a medical man between the ages of 7 and 12. Full particulars can be obtained from the Secretary at the office, 49, Bedford Square, London, W.C.1.

THE National Council for Combating Venereal Diseases, 80, Avenue Chambers, Southampton Row, W.C.1, has issued the first number of *Health and Empire*, its new monthly journal; the price is 6d. Introductory notes are signed by the President, Lord Gorell, and Sir Malcolm Morris.

WE have recently been informed that post-graduate courses have been held in Vienna during October and November, and that a new course began on December 1st. The subjects dealt with include anatomy and physiology; medicine, surgery, orthopaedics and the diseases of children; eye and ear diseases; skin diseases; venereal diseases; urology and the use of *x* rays in the diagnosis of diseases and injuries of the head. Full particulars can, we understand, be obtained from Professor Wenckebach, 1, Medizinische Univ.-Klinik, Lazarettgasse 14, Wien IX.

ON the occasion of the centenary celebrations of the birth of Louis Pasteur, there will take place from May to October, 1923, an inter-allied exhibition of hygiene at Strasbourg, the city where Pasteur spent his life from 1849 to 1854, as professor of chemistry. This exhibition will be organized under the auspices of the Pasteur Institute of Paris, and of the city and the University of Strasbourg. Individuals and societies interested in the Urban Public Health Section of this exhibition may obtain further particulars from l'Exposition interalliée d'hygiène, Strasbourg 1923, 2e section (Hygiene urbaine), 1, Quai Lezai-Marnésia, Strasbourg.

A SUCCESSFUL reunion dinner of the Prince of Wales's Hospital and North-East London Post-Graduate College was held at the Trocadero Restaurant, with Dr. Arthur Giles in the chair, on October 27th. It was unanimously decided that a Reunion Association be formed in connexion with the Hospital and Post-Graduate College, and a committee was appointed for this purpose. Dr. Jenkins Oliver, 1, Devonshire Place, W., and Mr. S. O. Rashbrooke, 15, Gordon Street, W.C., agreed to act as honorary secretaries, to whom all inquiries and communications should be addressed.

ACCORDING to *La Medicina Contemporanea*, the number of deaf-mutes in Portugal amounts to 75 per 100,000 inhabitants, a higher proportion than in any other European country.

THE annual address of the Newcastle-upon-Tyne and Northern Counties Medical Society will be delivered in the library of the Royal Victoria Infirmary on Friday, December 9th, at 4.45 p.m., by Mr. Herbert Tilley, F.R.C.S., Surgeon to the Ear and Throat Department, University College Hospital, London. Mr. Tilley's subject is "Some common diseases of the ear, throat, and nose." The annual dinner will be held the same evening in the Grand Assembly Rooms, Barras Bridge, at 7.15 p.m. Price of ticket 15s. Application to be made to Mr. Norman Hodgson, 14, Jesmond Road, Newcastle.

A MEETING of the Association of Economic Biologists will be held at 2.30 p.m. on Friday, December 9th, in the Botanical Lecture Theatre of the Imperial College of Science, South Kensington, S.W.7. The chair will be taken by the President, Sir David Prain, F.R.S. Professor J. H. Priestley, of the University of Leeds, will open a discussion on "The resistance of the normal and injured plant surface to the entry of pathogenic organisms."

AT the meeting of the Hunterian Society to be held on Wednesday next, December 7th, at 9 p.m., at Sion College, Embankment, E.C.1 (close to Blackfriars Bridge), Sir Henry Gauvain will read a paper on "Surgical Tuberculosis," which will be illustrated by lantern slides. All members of the medical profession are cordially invited to attend.

THE next New Zealand Medical Congress will begin at Wellington on February 27th, 1922. It will be opened formally by His Excellency the Governor-General (Viscount Jellicoe). The Section of Medicine will hold its session on February 28th; the principal discussion, on "Medical treatment of diseases of the alimentary tract," will be introduced by Dr. W. Marshall Macdonald. The Section of Midwifery and Gynaecology will meet on March 1st, when a discussion on "Maternal mortality" will be opened by Dr. Henry Jellett. The Section of Surgery will meet on March 2nd, the chief subject for discussion being "Cancer of the large bowel," which will be introduced by Dr. Robertson. The Congress will continue until March 3rd, when, in the evening, the annual dinner will be held.

THE *Times* announces that as a result of recent negotiations the control and distribution of help for Russian scientists has been entrusted to the Finnish official representative in Petrograd. So far some 90 tons of foodstuffs have been delivered from Finland for this purpose.

Letters, Notes, and Answers.

As, owing to printing difficulties, the JOURNAL *must be sent to press earlier than hitherto, it is essential that communications intended for the current issue should be received by the first post on Tuesday, and lengthy documents on Monday.*

ORIGINAL ARTICLES and LETTERS *forwarded for publication are understood to be offered to the* BRITISH MEDICAL JOURNAL *alone unless the contrary be stated.*

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names—of course not necessarily for publication.

AUTHORS desiring reprints of their articles published in the BRITISH MEDICAL JOURNAL are requested to communicate with the Office, 429, Strand, W.C.2, on receipt of proof.

IN order to avoid delay, it is particularly requested that ALL letters on the editorial business of the JOURNAL be addressed to the Editor at the Office of the JOURNAL.

THE postal address of the BRITISH MEDICAL ASSOCIATION and BRITISH MEDICAL JOURNAL is 429, Strand, London, W.C.2. The telegraphic addresses are:

1. EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology, Westrand, London*; telephone, 2630, Gerrard.
2. FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate, Westrand, London*; telephone, 2630, Gerrard.
3. MEDICAL SECRETARY, *Mediscra, Westrand, London*; telephone, 2630, Gerrard. The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin (telegrams: *Bacillus, Dublin*; telephone, 4737, Dublin), and of the Scottish Office, 6, Rutland Square, Edinburgh (telegrams: *Associate, Edinburgh*; telephone, 4361, Central).

QUERIES AND ANSWERS.

INCOME TAX.

"G. M.," a medical woman, has a nominal salary of £517 per annum, but from this £130 is deducted for board and lodging. She asks if she is liable on the £517?

*** On the facts stated, yes. If the terms of the appointment were that the salary was to be £387, *plus* board and lodging, the result would be the same so far as "G. M." is concerned, but the legal position would be different and the income tax liability would be on £387 only.

"S. B." has been separately assessed to tax on a fee of £3 3s. received from a medical board for acting as substitute for his chief.

*** If, as the word "chief" implies, "S. B." is acting as an assistant, the assessment is technically correct, the reason being that there are apparently no "profits," as distinct from the remuneration of employment, into which it can fall as a sundry receipt. With regard to "unexpected outlays incurred during the year," these would be allowable only where the income is assessable on the current year's basis—as in the case of an emergence of a new class of earning. We cannot say to what extent it is the practice to make such small separate assessments as the one in question.

"D. M." inquires, "What is the last day on which I can claim any further expenses for 1921-22," and "Can the purchase price of a car be deducted?"

*** The return already made is presumably based on the profits—that is, the excess of the receipts over the expenses—of the past three years. The expenses in the financial year

itself do not seem to affect the assessment. The expense allowable in the case of the purchase of a car is the net cost of buying a car similar in power and quality to the one discarded.

"T. G. H." bought a car for £300, and in 1920 sold it for £420 and bought a car of the same make and horse-power for £759. What deduction can he claim?

*** Assuming that the displaced car was new when he bought it, the appropriate deduction is £759−£420=£339. The local inspector has apparently overlooked the official statement made before the Royal Commission on the Income Tax to the effect that the allowance is to be based on the actual replacement cost notwithstanding rise in price.

LETTERS, NOTES, ETC.

Chaulmoogra Derivatives.

In a recent article upon the treatment of leprosy (BRITISH MEDICAL JOURNAL, November 19th, 1921, p. 851) reference was made to the history of the chaulmoogra oil derivatives, and it was stated that Dean and Wrenshall had recently isolated chaulmoogric and hydnocarpic acids, and had assigned formulae to them. Dr. T. A. Henry has written to us pointing out that Dr. Power and his co-workers in the Wellcome Chemical Research Laboratories, isolated the above acids seventeen years ago and assigned them to chemical formulae. We regret that through inadvertence we should have failed to give credit to Dr. Power and the other workers concerned for this very important advance in the chemistry of chaulmoogra oil.

Motor Cars—Spare Parts.

"Regius" writes, with reference to this subject, on which several letters have appeared in our correspondence columns: My experience has been similar to that of your correspondent, Mr. Lionel Stretton. A short time ago I ordered by letter a spare part costing £10 10s., enclosing a cheque for that amount with my order. After waiting five days I wired the firm, asking if my letter had been received. Only after this was the part sent on. Finding that an additional spare part, costing 30s., was necessary to complete the repair, I wired the firm on a Friday, asking them to dispatch the part by passenger train on Saturday so as to save postal delay at the week-end. I got no reply till Tuesday afternoon, when I received a letter demanding payment of the 30s. first. This latter "spare" held me up for seven days, during which I could not use my car. I hope medical men will take note of the shabby treatment served to some of their colleagues by British motor firms which claim to sell ideal cars for doctors and treat our urgency orders for spare parts with such scant courtesy.

Dr. G. W. Middlemiss (Settle) writes: Dr. Stretton and Dr. Bletchly have been unfortunate in their choice of make of motor car, and the latter's experience of inability to obtain spare parts for a foreign-made car is not uncommon. An old-established and reputable firm of British motor car makers create no difficulties, and send spare parts the same day on receipt of telegram, or by return of post on receipt of letter, asking for payment within a month, being as prompt as any American firm. I have an Arrol-Johnston car, bought new in 1912, and spare parts have always been sent to me by return of post, and this firm is as courteous regarding payment as it prompt in dispatch. If motor car users would deal with sound British firms they would have no difficulty in this matter of spare parts.

Varicella and Herpes Zoster.

Dr. P. W. Black (Criccieth) writes: I have been attending a middle-aged lady for chicken-pox. I asked her if she had been exposed to any infection. She replied "No." I then asked her if she had been near anyone with shingles. She replied, "Oh, yes, I have been nursing a friend of mine." She then told me she had had a letter from a friend in Australia who was suffering from shingles and went to stay in a house where there were a lot of children, and all the children developed chicken-pox. I think as many of these cases ought to be reported as possible.

Acute Otitis Media in Infants.

Mr. M. R. Soni, M.B., Ch.B.Edin. (Stepping Hill Hospital, Stockport), writes: This note is written with a view to expressing my belief that the mastoid cells, antrum, and middle ear on both sides should be explored as a routine measure when performing a *post-mortem* examination on the body of an infant. This is particularly so in medico-legal cases and in those in which no other apparent cause of death can be discovered.

J. D., a fine healthy child, aged 6½ months, admitted into the hospital for nursing, as his mother was ill at home. He took the bottle well, and gained weight each week, till one afternoon he was suddenly taken ill with vomiting. He vomited about six times, and rapidly became exhausted. He was constipated, and everything administered was rejected. The neck was not retracted, and no evidence of meningeal trouble was present. He gradually sank into a comatose condition, and died in thirty hours. A diagnosis of gastritis was made, suggested by persistent vomiting, sunken fontanelles, apparent tenderness of abdomen, etc. At the necropsy no cause of death was discovered till the antrums and middle ears were explored, when they were both found full of pus. The drums were unruptured, but bulging outwards. The mucous membrane of the stomach and intestine was normal.

There is no doubt that death was due to acute septicaemia set up by inflammatory process in the middle ear. The vomiting, in my opinion, was purely of reflex origin. The remarkable thing about the case is that there was no local lesion in the form of a discharge from the ears or swelling over the mastoid process to draw my attention to the source of trouble. On more than one previous occasion have I found pus in the middle ear when its presence was not even suspected.

Stray Thoughts.

Dr. Thomas Carruthers (Kilbarchan, Renfrewshire) writes: Here are one or two of the stray thoughts of a general practitioner. Who is it who sees wonderful recoveries? I never do. A wonderful recovery is the result of a wonderful prognosis. Why should it be that the measles rash comes out first about the face and neck and the scarlet fever rash about the chest, and why should they differ in character even then? "O, I would like to ken . . . the reason o' the cause and the wherefore o' the why." Why anything, in fact! Such questions are oppressive and betray our awful ignorance. A specialist is a useful man apt to lose the sense of proportion. Prognosis depends a great deal on knowing what has been going on before (προγνοσκω!). Those who pay pay and those who don't don't, charge what you like. Can anyone give the chain of reasoning whereby I prescribed spectacles for fortnightly menstruation? The key was via the nervous system, and the cure was absolute.

The M.B. of the University of London.

"M." writes: The medical student entering hospital with the idea of ultimately taking his M.B., B.S.Lond. degrees has a long and expensive time before him. If he is hard working and "has the luck" to get through all his examinations the first time he enters for them he qualifies for the degree in the scheduled time. If he comes down, however, in the Second M.B. in June he has to wait till the following March before having a chance to go up for the examination again. Surely there should be an examination about December. He would then have a chance to enter upon his real hospital studies, if he passed, at the commencement of the year, instead of missing a whole winter session. There is no doubt that a number of students who fail in the Second M.B. in June take the Second Conjoint in the September following and pass straight on to their hospital work. Some of these may take the Second M.B. in the following March, but a good many very probably drop it altogether. Surely it is only fair for the University of London to hold a Second M.B. examination between June and the following March.

X-Ray Photography.

Kodak, Limited (of Kingsway, London), have issued a 50-page booklet, entitled *X Rays*, which they are distributing free to members of the medical profession. It does not claim to be a handbook of radiology, but simply to give a lesson or two in the art of obtaining technically good *x*-ray negatives. A very clear description of elementary *x*-ray physics is given, and then the technique of exposure and development is described, more especially from the point of view of the user of *x*-ray plates and films, although every dabbler in photography might learn something new from these pages. At the end there is a price list of *x*-ray accessories supplied by this firm.

Vacancies.

Notifications of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 51, 54, 55, 56, 57, and 58 of our advertisement columns, and advertisements as to partnerships, assistantships, and locum tenencies at pages 52, 53, and 54.

SCALE OF CHARGES FOR ADVERTISEMENTS IN THE BRITISH MEDICAL JOURNAL.

	£	s.	d.
Six lines and under	0	9	0
Each additional line	0	1	6
Whole single column (three columns to page)	7	10	0
Half single column	3	15	0
Half page	10	0	0
Whole page	20	0	0

An average line contains six words.

All remittances by Post Office Orders must be made payable to the British Medical Association at the General Post Office, London. No responsibility will be accepted for any such remittance not so safeguarded.

Advertisements should be delivered, addressed to the Manager, 429, Strand, London, not later than the first post on Tuesday morning preceding publication, and, if not paid for at the time, should be accompanied by a reference.

Note.—It is against the rules of the Post Office to receive *poste restante* letters addressed either in initials or numbers.